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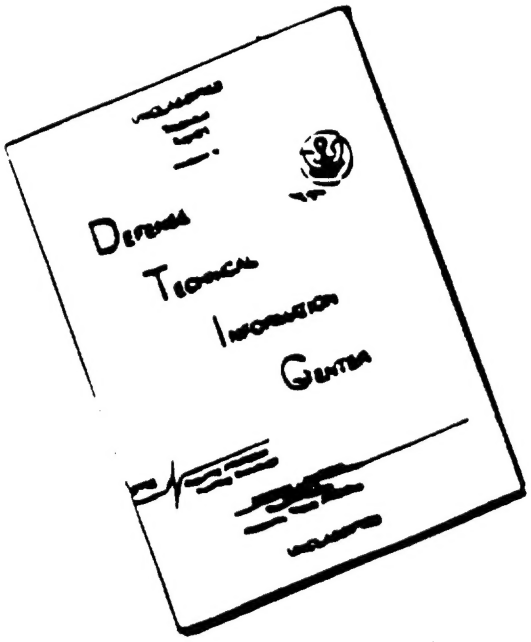

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THE FIELD HOSPITAL AT ZAGREB:

A DATABASE FOR MILITARY MEDICAL RESOURCE PLANNING IN OPERATIONS OTHER THAN WAR

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SUMMARY

Problem

The Department of Defense (DoD) recognizes that the Medical Readiness Strategic Plan (MRSP-2001) fails to address the need to develop enhanced capabilities, within the military, for providing humanitarian aid in operations other than war (OOTWs).[1]

Objective

Systematic, in-theater, on-site data collection can facilitate DoD's strategic planning for US military medicine in OOTWs. To facilitate that process, the primary objective of this investigation was to review the triservice patient database deployed in Zagreb. This review includes (1) a description of the origin, rationale, structure, and implementation of the database; (2) a characterization of the patients who used medical services provided by the hospital, and a description of their rate and flow through the system; (3) a description and enumeration of the patient conditions presented in outpatient visits (OPVs), admissions and dispositions (ADDs), and surgical operations (OPRs); and (4) a description of the use made of available medical services by various population subgroups of interest.

Approach

In this report we present (1) a review of the structure and use of a medical patient information database designed and implemented in a triservice field hospital deployed to Zagreb, Croatia, during Operation Provide Promise, and (2) a descriptive analysis of medical patient data that were collected in this database over a period of 18 months between September 1992 and March 1994. Because they are derived from a unique US involvement in a United Nations-directed multinational peacekeeping operation, these data may provide military medical planners and logisticians with useful insights into the specific materiel, skills, and knowledge requirements demanded by such missions.

The database was designed and written in Microsoft ACCESS™. After reviewing the structure and content of the database, inconsistencies between related records in different tables were reconciled. Numerous simple unidimensional tabulations were performed utilizing the querying capabilities of the application. More complex computations were performed by exporting relevant data to Microsoft Excel™[2] or to SPSSx™.[3]

Results

Nearly 16,000 medical records were reviewed for this report. Data pertaining to demographic characteristics, OPVs, ADDs, and OPRs were obtained for 4612 military and nonmilitary patients. Approximately 20% (n=928) of these were admitted as inpatients at least once and approximately 9% (n=408) underwent at least one surgical procedure during the 18 months between October 1992 and April 1994. Due probably to the tenuous cease-fire

that was in place during this time, few (less than 2% of the patient population) battle- or war-related injuries were treated. Length of stay for inpatients averaged 6.4 days, but more than 14% of 1004 total admissions (n=141) were hospitalized for more than 10 days.

Conclusions

This patient medical data from the field hospital in Zagreb will be useful in planning military medical materiel, skills, and knowledge requirements in future OOTWs. In addition, and perhaps more importantly, the effectiveness of the data collection should encourage the development of a servicewide effort to collect such data during all operations and contingencies, peacekeeping or otherwise. Planning based on both data and anecdote, rather than on anecdote alone, can only improve medical readiness and increase the quality of medical care delivered by the military medical services.

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INTRODUCTION

An amended draft of the Medical Readiness Strategic Plan (MRSP) 2001 asks the military medical services to develop enhanced capabilities for delivering medical services in operations other than war (OOTWs).[1] OOTWs include various organized humanitarian responses to natural disasters, to both peacekeeping and peace-enforcing operations and to general refugee missions.[4,5] US military medicine's experience in such missions has grown during the past decade but remains limited when compared with the experience of such nations as Norway and France where, for several decades, a high priority has been placed at the policy level on the creation and maintenance of such capabilities.[4,5]

Department of Defense (DoD) planning for OOTW-related medical missions must go forward however, for, while the end of the Cold War reduced the probability of large-scale global conflict between superpowers, economic discontent, as well as resurgent nationalism and ethnocentrism in many quarters of the world has increased the frequency of local, geographically constrained disturbances.[4,5] The Zagreb database. described herein, arises out of the convergence of these new geopolitical conditions and the now widespread technological capability within the services to electronically collect, process and store information, in-theater and on-site. The Zagreb data can help logisticans plan for future OOTWs, and the Zagreb database points toward a method by which empirical data from past operations can be used to inform the planners of future operations.

BACKGROUND

Between October 1992 and December 1995 the US Joint Forces deployed a 60-bed Mobile Army Surgical Hospital (MASH) to the edge of an airfield at Camp Pleso, Zagreb, Northern Croatia. This was Operation Provide Promise, and its defined purpose was to make 24-hr medical support available to more than 25,000 personnel under the United Nations command that was attempting to sustain a fragile peace on the war-ravaged Balkan Peninsula. The mission was unique: Not only was it a triservice endeavor for the US military medical corps; it was also a multinational mission in which the field hospital operated under the leadership of Adm. Smith, Navy Commander in Chief in Europe and commanding officer of the Joint Task Force, in cooperation with the United Nations Protective Force (UNPROFOR).

Although established by the US Army's 212th MASH unit (deployed from Wiesbaden, Federal Republic of Germany) it was never intended in this operation that the facility serve in concordance with its description as a "mobile" unit. Nor did its day-to-day operation ever fit neatly into any description consistent with the echelon system of combat casualty management. Rather, throughout Operation Provide Promise, the hospital served as a stationary facility that provided definitive treatment for only a very few severe, war-related injuries, and

something more akin to garrison care for the multinational forces, for civilian UN employees, and, from the midpoint of the deployment on, for refugees from the Croatian, Bosnian, and Macedonian sectors of the former Yugoslavia.

The hospital was commanded in 6-month rotations by medical units from the US Army, Navy, and Air Force. Between October 1993 and mid-March 1994, during the deployment of the US Air Force's (USAF) 48th ATH (Air Transportable Hospital), a database was designed and constructed on a PC platform, to record, track, and store detailed medical data for patients treated at the facility. Therefore, a substantial amount of information reflecting activities at the MASH during the first 18 months of its operation was methodically collected, collated, and archived in this system. In response to the amended requirement in MRSP-2001 to develop a strategic and tactical military medical capability for operations other than war, both the database and its contents are described here. The data should assist logisticians in their thinking about the construction of supply and equipment assemblages appropriate for OOTWs conducted in theaters similar to Northern Croatia. The applied concept of data, systematically collected in-theater and on-site, and its potential uses for both planning and for medical and administrative management, should be of interest to military policy-makers.

THE DATABASE

Origins

The Zagreb database grew out of an interest in microcomputer-based medical information systems that was shared by a highly computer-literate commanding officer and a staff physician, both of whom deployed to Camp Pleso with the 48th ATH in the Fall of 1993. They also shared an awareness that the deployment to Zagreb was likely to be of historic interest to US military medicine in that this hospital, mobile by design and definition, was operating as a fixed installation, and was providing definitive care, not to US troops wounded in action, but to a diverse population of United Nations troops and support personnel involved in a peacekeeping effort.

Additionally, they believed that clinical care of patients could improve with the use of a simple, in-house medical information system. They were certain that the day-to-day administration and management of a deployed facility such as the one in Zagreb would be made easier and more efficient through the thoughtful application of a such a system, even if it was dependent upon relatively obsolete hardware and lacking a networking capability. Thus, they decided that they would design and implement a database that would allow them to systematically document the medically relevant aspects of the operation both for the historical record, and for purposes of facilitating the patient-care/administrative functions of the institution.

In administrative terms, it quickly became obvious to the commanding officer of the 48th that the hospital needed a more effective, efficient, and practical system of communication with Joint Task Force (JTF) headquarters in Naples, with the office of the UNPROFOR

Field Medical Officer (FMO), and with an assortment of other entities up, down, and across the rather complex chain of command. (This was not an insular US operation. Therefore, communications protocols either did not exist or, if available, were sufficiently convoluted and ill-defined as to impede rather than facilitate the mission.) Consequently, even though not mandated by higher echelons, the ad hoc design and implementation of the database became a most useful exercise, locally pursued, for both documentary and functional purposes.

Following the departure of the 48th ATH in mid-March 1994, command of the field hospital was assumed respectively by the Navy's Fleet Hospitals Six and Five, and the Air Force's 60th and 74th Medical Groups. A manual describing the structure, operation, and maintenance of the database was included in the After Action Report produced by the 48th ATH, and the 48th staff spent time during transition teaching the identified personnel from Fleet Hospital Six about its day-to-day operation. In December 1995, the hospital was deconstructed by the 74th Medical Group of the USAF. The microcomputers and hard disks containing whatever additional data had been collected by the commands that followed the 48th ATH were returned to the continental United States (CONUS).

Structure

A complete and detailed description of the database's design and operation can be found in the After Action Report of the 48th ATH (see Appendix A). The brief description that follows here is included to provide a framework for understanding the origins of the data presented later.

Four data tables were created to contain (1) patient demographic information (one record for each patient seen at the hospital for any reason); (2) data on outpatient visits (OPVs; one record per visit to the Emergency Room [ER], to the Orthopedics or Physical Therapy clinics or to the Dental Clinic, and one record per admission to inpatient status); (3) admissions and dispositions data (ADDs; one outpatient record for each admission, whether for an overnight inpatient stay or for a same-day surgical procedure); and (4) information related to operations and anesthetic events (OPRs; one record for each operation performed). Logically, a patient could not be logged into the patient data table unless he/she was logged at least once into the outpatient, admissions, or operations table. In addition, a logged operation required a logged admission (although there could be more than one surgical procedure per admission), and a logged admission required a logged outpatient visit.

During the coding and entry of data by the 48th ATH, initial OPVs for a discrete illness or injury were recorded in each clinic when the patient/condition presented for the first time. In other words, a patient could have more than one initial visit for the same condition, but not to the same clinic. If, for example, a patient presented at the ER with a knee injury, an initial visit was logged for the ER on that date. If this patient was then referred to the Physical Therapy clinic, his/her first visit to PT for this particular knee injury was flagged as a new case. Although subsequent visits to PT would be logged as follow-ups, the first appointment was always coded as an initial visit to provide the clinic with incidence data for its services. This convention for distinguishing initial from follow-up visits led to some confusion in the

form of overestimating total incidence of initial visits to the facility. For purposes of avoiding overestimation of OPVs in this report, initial visit status was confined to the first contact by a patient with the facility for a particular illness or injury. Any subsequent visit to any clinic for this particular problem, was defined as a follow-up visit.

Table 1

Database Tables and Fields

Tables	Patient Data	Outpatient Visits	Admission/ Disposition	Operations
Fields	*Patient No.	*Patient No.	*Patient No.	*Patient No.
	Last Name	Visit No.	**Register No.	**Register No.
	First Name	Date of Visit	Date Admitted	OR Case No.
	Middle Initial	Time of Visit	Time Admitted	Room No.
	Epithet	Clinic	Date Discharged	Operation Date
	Title	Provider	Time Discharged	Anesthesia Start Time
	Grade	Smoker?	Discharge Clerk	Anesthesia End Time
	Sex	Flu Shots?	Primary Provider	Surgery Start Time
	DOB	Tetanus Shots?	Serious Illness?	Surgery End Time
	SSN/AN	Chief Complaint	Death?	Nursing Start Time
	Nationality	Accident?	BI or DNBI?	Nursing End Time
	Married?	Accident Category	Reportable Disease?	Surgical Diagnoses
	Religion	Diagnoses	Diagnoses	ICD-9 Codes
	Race	ICD-9 Code	ICD-9 Code	Urgency
	Branch	Treatments	Procedure	Circulator
	Corps	Primary Dx Category	Procedure Code	Scrubbed
	Organization	Follow-Up Visit?	Primary Dx Category	Anesthetist
	Address	Battle Injured?	Dx Organ Systems	Surg Assistant
	Mil/Civil?	Major Injury?		Anesthetic Used
	VIP?	Ophthalmologic?		Procedure
		ETOH-Related		Procedure Codes
		Battle Injury Code		Procedure Types
		Non Battle Injury Code		Surgeon
		Admitted?		Transfusion?
		Urgency Level		Specimens?
		Walk In?		Drains?
		Dental Tx Category		Implants?
		Referral?		Remarks

*** Unique ID linking patient records across four tables**
**** Unique number linking surgical procedures to an admission**

Data entry screens were designed for each of the four data tables to facilitate accurate and complete data entry. An additional 22 lookup tables supported the pop-up menus connected to the data entry screens and the data entry process. Table 1 of this report contains a list of all fields in the four data tables. Cross-table indexing was accomplished through the use

of unique patient identification numbers as key fields. Registration numbers unique to a specific admission linked each operative procedure to a specific patient admission in the ADD table.

Patient data generated during occupation by the 48th ATH were entered on non-networked computers located either in the patient administration area, in the ER, in the operating suite, or in another ancillary site. In addition, a master copy of the database, updated daily, was managed by the system operator on a separate computer. Consistent with good database management and security, previously entered data could be modified only on the master copy.

Data collected earlier, by the 212th and the 502nd MASH units (in the form of hard-copy documentation) was collated by staff 48th staff and entered into the system retrospectively when time permitted. Complete ADD records were found for both the 212th and the 502nd. Emergency room (OPV) logs existed in complete and nearly complete summary form for the two earlier commands, respectively. Complete operating room record sets were available for both earlier units, but only partial records were obtained for orthopedics and physical therapy clinics. Dental data were entered for both the 212th and the 502nd but since hard-copy records were thought to be incomplete, caution should guide any interpretation of these figures. Scheduled visits with the hospital's mental health officer were never entered into the database because of confidentiality issues, although the psychiatrist did keep his own records on paper so that summary numbers could be included in various mandatory reports. Data on psychiatric diagnostic classifications described later in this report come not from scheduled mental health visits during the deployment of the 48th but rather from after-the-fact classifications of diagnoses presenting at the ER during the course of all three deployments.

Numerous query-generated reports also were designed and constructed in an effort to make communications between administrative and command entities more efficient, as previously mentioned. Report queries extracted data from the tables, copied them to prepared formats for communication with the JTF, with the US Air Force Europe/US European Command (USAFE/EUCOM), and with the United Nations Protective Force Field Medical Office (UNPROFOR/FMEDO). Thus, accurate, current and finished copies were efficiently printed with a few simple keystrokes.

Classification of Diagnoses

Higher echelons in both the UNPROFOR and US chains of command required regular reports on the illnesses and injuries treated at the hospital. Each had its own template for assigning diagnoses to general categories, and each was distinct from the other in terms of how it was organized. Fortunately, however, with one exception, each scheme was also inclusive of the other, in terms of diseases and injuries covered. The exception was related to the USAFE/EUCOM category of "eye illness/injury," which, from its name, can be seen to join ophthalmologic injury and ophthalmologic illness into one category, where injury and illness are always separate categories in the UNPROFOR diagnostic scheme. This incompatibility turned out to present neither practical nor programmatic difficulties because

the numbers of ophthalmologic illnesses and injuries were small, and because in both UNPROFOR and USAFE schemes injuries were always distinguished from illnesses on their respective code forms. In any event, the database was designed to include all diagnostic category divisions from both schemes so that summary data could be unambiguously produced for either command according to its respective requirements and schedules.

Line officers and medical professionals at the local level had classification needs of their own. For example, reportable diseases were documented, and accidents and their causes were monitored closely, by various offices at Camp Pleso. In addition, medical professionals at the 48th found the USAFE/UNPROFOR diagnostic classification scheme somewhat lacking in the clinical detail they believed necessary to keeping track of their own work. With no nosologists available and having no expertise themselves in the ICD-9 coding that might have helped them in their tracking efforts, they created an algorithm based on a diagnostic organ system classification scheme, which permitted the generation of more clinically discernable subspecialty statistics. They then applied this algorithm to the coding of their own data as well as to the data of the earlier commands.

DATA

Patient Demographics

Between October 10, 1992, and March 17, 1994, 4612 persons were either seen in one of the hospital's outpatient clinics, admitted to one of its 60 beds as inpatients, or operated upon in one of the hospital's four operating rooms. More than 6000 discrete medical conditions were treated during the course of 9767 OPVs. Over 18 months, 1004 admissions were logged, and 538 surgeries were listed in the record of operations. Table 2 contains a tabulation of OPVs, ADDs, and OPRs by unit command over the course of the first three deployments, and Figure 1 shows the hospital's outpatient census as a function of time.

The number of OPVs per month is seen to increase by a factor of roughly 4.3 between mid-deployment for the 212th MASH in January 1993 and mid-deployment for the 48th ATH in January 1994. One would naturally expect to see patient numbers increase as potential users in sectors proximal to Camp Pleso became aware of the hospital's existence and as operation of the new facility approached optimal efficiency following start-up. However, the rate of growth seen during the deployment of the 48th ATH was extraordinary and may have had several causes. Firstly, on taking over command from the 502nd MASH, the 48th ATH immediately increased the number of daily and weekend hours during which medical and dental care were available to members of UNPROFOR contingents stationed at and near Camp Pleso (ie, sick call was expanded to 24 hr a day). This change in policy had a salutary effect on political relationships between the US hospital and the non-US contingents that were dispersed throughout Camp Pleso. During earlier deployments, numerous divisive issues had arisen between US and UN personnel that had the affect of diverting potential patients from the contingents away from the emergency room and primary care services of the hospital.[6] Secondly, it was during the 48th's deployment that the mission of Operation Provide Promise was expanded to include refugees from the mortaring of Sarajevo and from other sectors of

Table 2

Outpatient Visits, Admissions, and Operations by Unit Command

	212th 11/15/92 to 4/26/93 (188 days)	502nd 4/27/93 to 10/4/93 (160 days)	48th ATH 10/5/93 to 3/20/94 (166 days)	ROW TOTALS (514 days)
Patients (seen for first time)	1178	1425	2009	4612
Patient Conditions (seen for first time)	1404	2008	3357	6769
Follow-Up Visits	216	464	2318	2998
Total Visits	1620	2472	5675	9767
Operations	206	144	188	538

Croatia, Bosnia-Herzegovina, and Macedonia where overt conflict still intermittently broke out. In fact, outreach visits to refugee camps became a part of the regular schedule for the 48th, where they had not been for either the 212th or the 502nd. A third factor that certainly could have lowered the OPV count in the earlier deployments was the high probability that some their OPV records were undoubtedly lost and/or unavailable for input by staff from the 48th for other reasons.

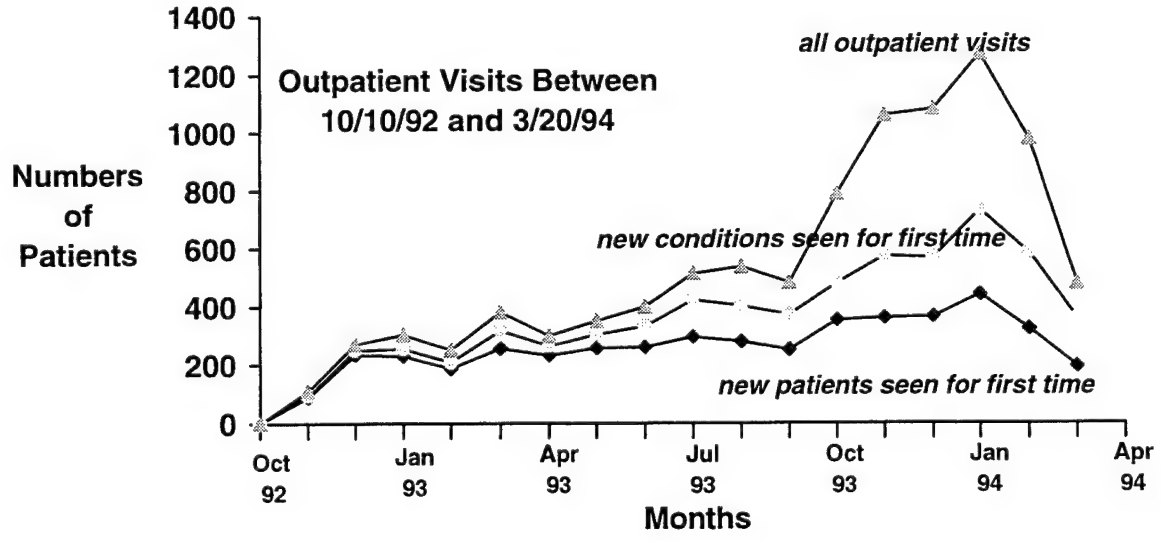

Figure 1. Hospital Outpatient Census as a Function of Time

Table 3

Patient Demographic Data

	Patients		Outpatient Visits		Admissions		Operations	
	N	%	N	%	N	%	N	%
Treated	(of 4612)		(of 9767)		(of 1004)		(of 538)	
Males	4136	(90)	8495	(87)	927	(92)	500	(93)
Females	476	(10)	1272	(13)	77	(8)	38	(7)
Military	3503	(76)	7415	(76)	876	(87)	487	(91)
Nonmilitary	1109	(24)	2352	(24)	128	(13)	51	(9)
Citizenship								
US	1002	(22)	3067	(31)	155	(15)	98	(18)
Non-US/Non-Third[a]	3086	(67)	5741	(59)	697	(69)	377	(70)
Third World	452	(10)	853	(9)	136	(14)	47	(9)
Unknown	72	(1)	106	(1)	16	(2)	16	(3)

Note: Percentages are derived from values for N at top of each column.

a. **Non-US/Non-Third World** nations include: Argentina, Australia, Belgium, Brazil, China, Canada, the Czech Republic, Denmark, Egypt, Finland, France, United Kingdom, Germany, Croatia, Iceland, India, Iraq, Ireland, Italy, Jordan, Lebanon, Luxemborg, the Netherlands, Norway, New Zealand, Pakistan, Poland, Portugal, Russia, Saudi Arabia, Switzerland, Slovakia, Spain, Slovenia, Sweden, Ukraine, Venezuela. **Third World Nations include:** Bangladesh, Burma, Columbia, Ecuador, Ethiopia, Ghana, Guyana, Jamaica, Kenya, Libya, Malaysia, Nigeria, Nepal, Peru, the Philipines, the Sudan, Tunisia, Uruguay, Zaire.

Table 4

Age Category by US, Non-US/Non-Third World and Third World Citizenship

	US		Non-US / Non-Third World		Third World		Unknown		Row Totals
Age Class	N	%	N	%	N	%	N	%	
17 or younger	2	(>1)	32	(2)	0	(0)	0	(0)	34
18-30	359	(50)	1206	(52)	79	(24)	11	(25)	1655
31-44	299	(42)	875	(38)	219	(67)	24	(55)	1417
45 or older	59	(8)	191	(8)	29	(9)	9	(20)	288
Totals	719		2304		327		44		3394

Note: Percentages in parentheses are column percentages.

Comparisons across three types of medical service utilization (OPVs, ADDs, OPRs) for males versus females, military versus civilian, and US versus non-US/non-Third World, and Third World patients are presented in Table 3. Note that non-US/non-Third World countries (ie, the European, and other developed nations) contributed roughly two thirds of all patients, ADDs, and OPRs, while the remaining third was contributed jointly by US forces and UNPROFOR personnel from the Third World. The proportion of OPVs contributed by non-Third World/non-US patients (59%) was slightly less than expected due to the fact that the largest of the contingents making up this group, the French and the British, had their own primary care services with them in Zagreb. At the same time, US personnel contributed slightly higher percentages than expected to OPV totals because the field hospital was the only source of treatment for the troops that manned it. Table 4 presents an age category breakout on the 73% of all patients treated for whom reliable birth dates were captured. Interestingly, 76% of patients from the Third World are 30 years of age or older, a third again as many found in that age bracket in the other two groups. Anecdotal reports suggest that service in UN military units constitutes an economically preferable option for many Third World citizens, and one might speculate that garrison medical preparedness for older persons might differ from readiness for younger age groups. Table 5 shows the contributions made to OPV, ADD, and OPR records by individual nations whose personnel were treated at the field hospital.

Outpatient Visits

Over 18 months, 9767 OPVs were logged at the facility for 4612 sick or injured patients. Of these, 69.3% (6769 visits) were for new medical conditions (ie, first visit for a new condition in a given patient) while the remaining 2998 OPVs (30.7%) were for follow-up of previously logged conditions.

Table 6 contains the numbers and proportions of conditions seen during outpatient visits fitting into various diagnostic categories. The classification scheme is inclusive of the combined requirements of USAFE/EUCOM and UNPROFOR/FMEDO. The scope of each diagnostic category is listed at the bottom of the table. As can be seen in the first row of data, more than one third of all visits resulted from injuries, both related and unrelated to war. More than 70% of the outpatient diagnoses seen during the period in review fell into injury, medical, and respiratory categories.

Only 85 of 4612 patients were treated for war-related injuries (WRIs) at this hospital during the first 18 months of Operation Provide Promise. We choose to speak of "war-related injuries" here rather than of "battle injuries" or "wounded in action" because so few injuries fit the strict or classical definition of these latter terms. For purposes of this report, we defined WRI to include any injury that resulted from exposure to the mechanisms or actions of war regardless of the military or nonmilitary status of the wounded. This includes the usual injuries that result from overt combat as well as those injuries resulting from the detonation of antipersonnel and antitank mines, for example, that may have been planted long before the wounding incident and that occur during periods of tranquility.

Table 5

Outpatient Visits, Admissions, and Operations by Nation

Nation	N	OPVs	Admits	Operations	Nation	N	OPVs	Admits	Operations
United States	1002	3067	155	98	Germany	16	29	1	1
France	619	967	128	72	Philipines	10	26	0	0
Great Britain	328	625	62	27	Ghana	12	23	2	0
Croatia	276	613	46	22	Brazil	14	21	0	0
Canada	269	438	93	36	Iceland	4	15	0	0
Argentina	141	400	36	31	Malaysia	9	13	1	0
Netherlands	235	357	26	11	Spain	9	13	1	0
Denmark	169	313	38	19	Pakistan	6	12	0	0
Poland	140	277	39	40	Lebanon	4	10	0	0
Jordan	158	290	43	14	Tunisia	4	9	0	0
Sweden	138	269	22	10	Burma	2	7	1	0
Nepal	104	216	38	18	India	2	6	1	1
Norway	125	251	14	6	Zaire	1	6	1	1
Russia	94	161	45	35	Ecuador	2	7	0	0
Kenya	129	183	38	7	Iraq	5	7	0	0
Czech Republic	43	135	23	29	Italy	7	6	0	0
Nigeria	74	112	30	12	Luxemborg	3	3	3	0
Finland	70	119	16	7	Peru	2	4	0	0
Unknown	78	106	15	15	Sudan	1	4	0	0
Slovakia	62	112	15	4	Slovenia	4	4	0	0
Ukraine	42	104	20	5	Uruguay	3	4	0	0
Bangladesh	37	98	7	2	Jamaica	3	3	0	0
Egypt	30	89	13	3	Venezuela	2	3	0	0
Belgium	35	47	17	8	China	1	2	0	0
Austria	21	47	0	0	Ethiopia	2	2	0	0
Ireland	25	36	2	0	Libya	2	2	0	0
Portugal	17	31	6	0	Saudi Arabia	2	2	0	0
New Zealand	10	32	1	0	Switzerland	1	2	0	0
Columbia	15	26	4	3	Guyana	1	1	0	0
					Totals	4612	9767	1004	538

Table 7 displays causes of WRI sorted by civilian/military and male/female status. While these 85 patients went on to generate 415 outpatient visits (initial presentations plus follow-ups; 4.2% of all OPVs), 83 admissions (8.3% of all ADDs) and 106 operations (19.7% of all OPRs) connected with their war-related injuries, the proportion of WRI patients (85 of 4612 or 1.8%) versus non-WRI patients (4527 of 4612 or 98.2%) overwhelmingly favored the latter. Military personnel accounted for seventy-two of 85 WRI patients. Thirteen (15.3%) were civilians, and 3 of these were children younger than 17 years of age. Several nonmilitary patients were identified as civilians working for UNPROFOR, and several were refugees from camps near Sarajevo and Mostar. Of the 13, 9 were Croatian, and 2 were Portuguese. One Indian and one citizen of Great Britain were also among the civilians.

Table 6

Outpatient Visits by Combined USAFE/UNPROFOR Primary Diagnostic Categories

Diagnostic Category	N of Outpatient Visits	% of Total
Injury (Combined War & Non-War-Related)	**3742**	**38.3**
Medical	**1888**	**19.3**
Respiratory	**1333**	**13.7**
Dental	**726**	**7.4**
Dermatological	**508**	**5.2**
Gastrointestinal	**466**	**4.7**
Surgical	**457**	**4.7**
Ophthalmological	**364**	**3.7**
Other	**87**	**0.9**
Sexually Transmitted Diseases	**84**	**0.9**
Psychiatric	**54**	**0.6**
Unknown	**24**	**0.2**
Substance Abuse	**23**	**0.2**
Heat/Cold Injuries	**6**	**0.1**
Fever of Unknown Origin	**5**	**0.1**
Totals	**9767**	**100%**

DEFINITIONS:

Injury	Those requiring hospitalization or surgery; fractures, sprains, lacerations, internal injuries, burns, and thermal injuries other than sunburn; nonenvenoming animal bites; other trauma includes battle, non-battle, occupational, and recreational injuries
Medical	Cardiac problems, such as chest pain, hypertension; neurological problems, such as headaches, seizures, syncope; allergic reactions, including systemic reactions to venomous bites/stings; hepatitis; urogenital illness not related to STD
Respiratory	Upper respiratory infection, colds, bronchitis, asthma, pneumonia, pharyngitis, otitis, sinusitis
Dental	Dental injury, disease, or condition requiring dentist intervention
Dermatological	Viral rashes, lesions, cellulitis, fungal, or bacterial infections; contact dermatitis from insect bites; skin ulcers and eschars
Gastrointestinal	Diarrhea, gastroenteritis, dysentery, gastritis, food poisoning, constipation, intestinal parasites
Surgical	Conditions requiring surgery that are not related to trauma (eg, appendicitis, cholelithiasis)
Opthalmological	Conjunctivitis, eye infections/irritations, corneal abrasions, foreign bodies, solar injury, trauma not with that reported under "Injury"
Other	Disease, illness, injury not otherwise classified
STDs	Gonorrhea, syphilis, chlamydia, genital herpes, PID, venereal warts/chancres
Psychiatric	Depression, situational reactions, anxiety, neurosis, psychotic reactions, suicide attempts, behavioral reaction to medications or substance abuse
Substance Abuse	Abuse of alcohol or illegal drugs, including marijuana, prescribed or unprescribed pharmaceuticals, or other substances
Thermal Injury	Heat strokes, cramps, exhaustion; dehydration, sunburn, frostbite, chilblains, hypothermia
FUO	Fevers not apparently associated with a diagnosable illness or injury

Table 7

Causes of War-Related Injuries in Civilian vs. Military and Male vs. Female Patients

	Gunshot Wound	Mine Explosion	Artillery Detonation	Unknown Cause	Row Totals
Military	24	35	7	6	72
Civilian	0	5	4	4	13
Male	23	38	9	10	80
Female	1	2	2	0	5
Totals	24	40	11	10	85

Admissions

Table 8 presents absolute numbers of persons admitted to the hospital and total numbers of admissions, contrasting males with females, military with civilian personnel and patients from the United States with patients from Third World and from non-US/non-Third World nations. Eight hundred eighty-two patients (882) accounted for 1004 admissions to the hospital. Of the 882, 48 were admitted twice and 8 were admitted 3 times over the span of 18 months. Women accounted for 7.7% (n=77) of all admits. Of 85 WRI patients, 73 accounted for 83 admissions (8.3% of all admissions), and 408 admitted patients (40.7%) underwent some sort of surgical procedure. Admitted patients came from 36 different countries and were, on average, an estimated 29.2 years of age (±8.6) at time of admission.

One hundred fourteen (12.9%) civilians were admitted to inpatient status, and 36 of these were Croatian nationals. Twenty-one admitted civilians were citizens of Great Britain, and 10 were from Denmark. The remaining 47 originated in 16 different countries.

Table 9 presents the combined USAFE/UNPROFOR primary diagnostic categories for admissions. Category definitions can be found in Table 6. It can be seen that injuries, medical and surgical diagnoses respectively constituted the three largest admission subsets. In Table 10 the Injury category from Table 9 is further broken down to show the distribution of sub specialties required to treat the admitted injuries in WRI and non-WRI patients. That 93% and 87% of the admissions for neurosurgically and orthopedically treated injuries were non-war-related, confirms the nontraditional nature of Operation Provide Promise.

Table 8

Admissions by Subgroups of Interest

Subgroup	N Admitted	N of Admissions
Males	821	927
Females	61	77
Military	768	876
Civilian	114	128
US Citizens	119	155
Non-US/Non TW	645	699
Third World	104	136
Unknown	14	14
WRI	66	83
Non-WRI	816	921
Totals	882	1004

Table 9

Combined USAFE/UNPROFOR Diagnostic Categories at Admission

Diagnostic Category	N	%
Injury	376	37.5
Medical	190	18.9
Surgical	189	18.8
Gastrointestinal	73	7.3
Dental	66	6.6
Respiratory	52	5.2
Ophthalmological	19	1.9
Psychiatric	13	1.3
Dermatological	10	1.0
Substance Abuse	10	1.0
Other	3	0.3
Sexually Transmitted Diseases	2	0.2
Heat/Cold Problems	1	0.1
Totals	1004	100%

Table 10

Injury Admissions by Treating Clinical Subspecialty

Treating Subspecialties	WRI Admissions N	%	Non-WRI Admissions N	%	Row Totals N
Orthopedic	**30**	(13)	**206**	(87)	**236**
Gen Surgery	**28**	(67)	**14**	(33)	**42**
Neurosurgery	**2**	(7)	**26**	(93)	**28**
Ear, Nose, & Throat	**1**	(5)	**21**	(95)	**22**
Post-Op	**6**	(67)	**3**	(33)	**9**
Burns (Plastic Surgery)	**1**	(14)	**6**	(86)	**7**
Other	**1**	(14)	**6**	(86)	**7**
Neurology	**0**	(0)	**5**	(100)	**5**
Thoracic Surgery	**2**	(40)	**3**	(60)	**5**
Abdominal Surgery	**3**	(75)	**1**	(25)	**4**
Infectious Disease	**1**	(50)	**1**	(50)	**2**
Ophthamology	**1**	(50)	**1**	(50)	**2**
Urology	**0**	(0)	**2**	(100)	**2**
Oral Surgery	**0**	(0)	**2**	(100)	**2**
Medicine	**0**	(0)	**1**	(100)	**1**
Rheumatology	**0**	(0)	**1**	(100)	**1**
Vascular Surgery	**1**	(100)	**0**	(0)	**1**
Totals	**77**	(20)	**299**	(80)	**376** (100)

A total of 6281 inpatient days were accumulated between November 1992 and mid-March 1994. The mean length of stay was 6.40 days (SD=10.8), with a range extending from 0 (for procedures not requiring overnight hospitalization; ie, same-day surgeries) to 152 days. While the modal stay was in fact 0 days, 141 of the 1004 admissions (14.1%) extended beyond 10 days, and 415 admissions (41.4%) extended beyond the 3-5 day limit, which commonly defines Echelon III medical facilities (see Table 11). It may be that lengths of stay for seriously ill or injured Third World citizens were intentionally extended relative to lengths of stay for seriously ill and injured personnel from more developed parts of the world because continued adequate management of some illnesses and injuries were often unavailable in their home countries. It has also been suggested that delay in discharge for Third World patients simply had to do with the absence of evacuation capabilities in their home countries. Whatever the cause, the fact of extended inpatient stays for Third World patients and for patients from non-US/non-Third World nations as well, was confirmed when length of stay for the three groups was compared statistically. Using one-way analysis of variance [3] mean length of stay was found to be 1.4 days (SD±2.5) for US inpatients, 7.0 days (SD±11.7) for non-US/non-Third World inpatients, and 9.5 days (SD±10.0) for Third World inpatients. These differences were significant, with F=15.87, p=.0001 (US < non-US/non-Third World < Third World: Neuman-Keuls, post hoc).

Table 11

Admissions: Length of Stay

Total inpatient days	**6281**
Mean length of stay	**6.4 days**
SD	**10.8 days**
Maximum stay	**152 days**
Minimum stay	**0 days**
Median stay	**4 days**

Detail

Stay	N	%
< 24 hr	**163**	**16.2**
1 day	**126**	**12.5**
2 day	**108**	**10.8**
3 day	**91**	**9.1**
4 day	**79**	**7.9**
5 day	**99**	**9.9**
6 day	**51**	**5.0**
7 day	**45**	**4.5**
8 day	**27**	**2.7**
9 day	**32**	**3.2**
10 day	**20**	**2.0**
> 10 day	**141**	**14.0**
Missing data	**22**	**2.2**
TOTALS	**1004**	**100.0%**

Operations

Surgeons from the three commands completed 538 operations on 408 individuals between October 1992 and March 1994. Three hundred fifty-one (351) patients underwent one surgical procedure only, while 57 patients underwent an additional 187 surgeries (numbers of surgeries in patients who underwent more than one operation ranged between 2 and 16. The latter includes numerous anesthetized wound debridement procedures for one burn patient). Table 12 presents diagnosis at surgical admission for all patients broken out by citizenship. Injury as a diagnostic category accounted for 56.7% of all surgeries, with non-US/non-Third World personnel accounting for 82% of all surgically treated injuries. Orthopedic surgical procedures were the type most commonly employed (n=242), accounting for 45% of all procedures (see Table 13).

Table 12

Diagnoses for Patients Admitted for Surgery from the US, From Non-US/Non-Third World, and From Third World Nations

Primary Diagnoses	US		Non-US/ Non-Third World		Third World		Unknown		Row Totals
	N	%	N	%	N	%	N	%	N
Injury	**23**	(8)	**251**	(82)	**22**	(7)	**8**	(3)	**305**
Surgical	**52**	(32)	**85**	(52)	**22**	(13)	**4**	(3)	**163**
Dental	**13**	(34)	**21**	(55)	**0**	(0)	**4**	(11)	**38**
Medical	**4**	(36)	**7**	(64)	**0**	(0)	**0**	(0)	**11**
Respiratory	**1**	(10)	**9**	(90)	**0**	(0)	**0**	(0)	**10**
Gastrointestinal	**1**	(13)	**6**	(75)	**1**	(13)	**0**	(0)	**8**
Ophthalmological	**0**	(0)	**0**	(0)	**1**	(100)	**0**	(0)	**1**
Dermatological	**2**	(100)	**0**	(0)	**0**	(0)	**0**	(0)	**1**
Other	**1**	(100)	**0**	(0)	**0**	(0)	**0**	(0)	**1**
Totals	**97**	(18)	**379**	(71)	**46**	(9)	**16**	(3)	**538**

Table 13

Operations by Surgical Procedure Type

	WRI Surgeries		Non-WRI Surgeries		Totals
Surgical Procedure Type	N	%	N	%	N
Orthopedic	**70**	(29)	**172**	(71)	**242**
Plastic	**14**	(19)	**59**	(81)	**73**
Abdominal	**11**	(17)	**54**	(65)	**65**
Oral	**3**	(6)	**48**	(94)	**51**
Genitourinary	**0**	(0)	**30**	(100)	**30**
Ear, Nose, & Throat	**0**	(0)	**28**	(100)	**28**
General	**0**	(0)	**17**	(100)	**17**
Rectal	**0**	(0)	**14**	(100)	**14**
Anesthetic	**5**	(56)	**4**	(44)	**9**
Thoracic	**2**	(40)	**3**	(60)	**5**
Endotracheal	**0**	(0)	**2**	(100)	**2**
Gynecological	**0**	(0)	**1**	(100)	**1**
Ophthalmological	**1**	(100)	**0**	(0)	**1**
Totals	**106**	(20)	**432**	(80)	**538**

DISCUSSION

Of interest in these data is the average length of stay for admitted patients (6.4 days ± 10.8). Beyond any confusion around the issue of where the field hospital stood in terms of the echelon system of care, the fact is that the average length of stay was relatively long. This was true for inpatient citizens of Europe and other developed areas (average length of stay: 7 days) as well as for sick and injured Third World patients whose average inpatient stay lasted more than 9 days. Although the practice of keeping very sick or injured patients hospitalized for extended periods caused no apparent problem in Zagreb, there are conceivable scenarios in which an unpredicted renewal of overt hostilities might create a mass casualty situation. Such scenarios could create dilemmas for medical staff responsible for deciding what to do with those patients occupying beds suddenly needed by the newly injured. Seriously wounded or sick US personnel who could not return to duty would of course be evacuated promptly to medical facilities capable of providing continuous and high quality care even if that meant evacuation to CONUS. Questions arise, however, regarding guidelines for the dispositon of seriously sick or wounded Third World personnel whose home nations had no such capabilities.

A second issue is connected with the fact that sick or injured US military personnel are generally culled from deployments to operational theaters. In multinational operations US military medical providers can expect to find that the troops and personnel of other nations are not necessarily as well screened before deployment. For example, several patients from the Third World who were treated at Zagreb were found to be HIV positive, and in general, dental health for non-US personnel was precarious. Although the data from Zagreb suggest that general level of demand for healthcare services was not greater for non-US contingents, the possibility exists that US military medical practitioners could face both nonlethal and lethal disease in multinational operations that would not commonly be found in unilateral missions. Logisticians, if provided with empirical data describing the health profiles of nations participating in joint operations, could augment assemblages of medical supplies and equipment to anticipate such variations as may occur.

Also of note in the Zagreb data is the elevated number of accidental injuries treated during the 18 months between October 1992 and March 1994. Between 35% and 40% of all OPV and ADD diagnoses were classified as injuries. Of 3742 injury-related OPVs only 11% (415) were caused by mechanisms of war. Of 376 admissions for injury, only 22% (83) were war-related. This means that accidental injuries, whether they were occupation-, sports- or recreation-related, incurred through motor vehicle accident and/or connected with alcohol consumption, accounted for 89% and 78%, respectively, of all injury-related outpatient visits and admissions. It also means, at least in theory, that these "accidents" were preventable to some perhaps significant degree. Analysis of the causes of these accidental injuries may point to some useful strategies for prevention.

CONCLUSION

Sharp et al.[4,5] recently summarized the history of US military involvement in operations other than war since World War II. In their survey they cite several acknowledged authorities who have supported the notion that it will be in our best interest to remain available and prepared for such operations for the foreseeable future. The amended MRSP-2001 responds to this advice by calling for the development of OOTW capabilities in the military medical services by the beginning of the next century.

Operations other than war present military medical personnel with challenges both in the planning and in the execution that are different in some fundamental ways from the challenges presented by armed combat between organized forces. However, planning to provide emergency medical assistance in OOTWs requires the very same basic knowledge required to plan medical operations in classical warfare scenarios (ie, some estimate of the rates of injury and disease per some number of potential patients per some period of time, and a list of patient conditions likely to be seen in the anticipated theater of operation).

The Zagreb database presents military planners and logisticians with comprehensive empirical data collected during a recent OOTW: data that describe the more complex demographics of an OOTW treatment population, and both the rate and flow of patients through the field hospital, as well as the patient conditions (ie, diagnoses) that presented at the hospital over the the 18 months during which data were collected. Although these data would probably be inadequate to the task of building assemblages for an OOTW deployed to a tropical area or to a desert, they can be useful in mounting a humanitarian response for settings resembling this one.

In sum, the data collected at the field hospital in Zagreb constitue a unique, systematically collected set of information that describes the ongoing medical activities of an operation other than war. Clearly, it is a resource of great value to medical planners and logisticians.

References

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Appendix A

After-Action Report of the 48th ATH

Tab H: Patient Database Design

[Zagreb Letterhead]

FROM: Maj Janet T. Martino

13 Mar 94

SUBJ: Tab H Patient Database Design

TO: After Action Report and Transition Document, 21 Sept 93 – 17 Mar 94

1. This tab is divided into three sections:

   a. Tab H1. Database Development. This section addresses the rational behind the way the database was designed and set up at the MASH. It includes a discussion of what was accomplished and how, and under what constraints, as well as outstanding problems and recommendations.

   b. Tab H2. Database Management. This section addresses the 'care and feeding' of the database. It includes detailed instructions on the 'how to' of data entry, and categorization for the end users, and intructions for verifying data, managing a pseudo-network, and maintaining the database file for the System Operators (SysOps).

   c. Tab H3. Database Structure. This section is comprised of reference tables detailing the structure of the database. This information will allow the SysOps to understand how the tables, queries, forms, and macros are interconnected, which is essential to the troubleshooting, and the further development of the database.

Tab H. Patient Database Design, Table of Contents

Tab H1 Database Development

Tab H. Patient Database Design, Table of Contents

Tab H2 Database Management

Tab H. Patient Database Design, Table of Contents

Tab H3 Database Structure

[Zagreb Letterhead]

FROM: Maj Janet T. Martino 13 Mar 94

SUBJ: Tab H1. Database Development

TO: After Action Report and Transition Document, 21 Sept 93 – 17 Mar 94

1. Personnel: There were no personnel specifically assigned to this project, with the exception of the project officer. However, there were many people involved with data entry, who were essential to the project's success.

DAFSC	Title	# Involved	Project Function
44M4	Staff Internist	1	Database development, SysOp
4A0	Patient Admin.	1 (Half time)	Assistant to the SysOp
4A0	Patient Admin.	3 (Part Time)	Entry of patient demographic data and admission data
4N051	ER Technician	varied	Entry of outpatient ER visits
4Y051	Dental Technician	2 (Part Time)	Entry of Dental visits
4N171C	Ortho Technician	1 (Part Time)	Entry of Orthopedic Clinic visits
45072	PT Technician	1 (Part Time)	Entry of Physical Therapy visits
4654	OR Nurse	1 (Part Time)	Entry of Operations

2. Phases

   a. Transition 1 (21 Sept 1993 – 7 Oct 1993)

      (1) There was no complete, electronic data collection from the prior deployed groups. The TAMMIS system was used by the 502nd MASH, and presumably by the 212th MASH, to enter data on the admissions to the hospital. However, this data was unavailable from the 212th and unrecoverable in any case, due to the limitations of the TAMMIS system. There was no electronic accounting of the outpatient visits.

      (2) Hard copy documentation of patient visits was found, albeit with some gaps. In some areas the documents themselves were fairly complete and available. In others, only summary logs were found. For other areas, there were either no records found, or such an incomplete set of records as to make entry of such data meaningless. The following table outlines the status of the recovered records by section.

Clinic	Documentation Available for Data Entry
A&D	Complete record set for the 212th (15 Nov 92 – 27 Apr 93) and 502nd (28 Apr 93 – 4 Oct 93)
ER	Complete set of summary logs for the 212th; reasonably complete record set for the 502nd
OR	Complete record set for both the 212th and 502nd
Orthopedics	Some records from the 502nd, none from the 212th
PT	None from the 212th; few from the 502nd
Dental	None from the 212th; scattered few from the 502nd, known to be incomplete, so not entered in the database

b. Deployment

(1) Data Entry

(a) The main goal and primary focus during this time was to retrieve and enter all of the data generated by the MASH since its inception. A no-frills database application was constructed using Microsoft ACCESS™ version 1.1[1]. Because the emphasis was on getting so much data entered, no attempt was made to create a polished application whose structure was protected from the end users. Therefore, some training for the data enterers was required and the System Operator (SysOp) had to continuously peruse the data entered for mistakes.

(b) The magnitude of the project was enormous for our resources, involving entering nearly 16,000 records. Approximately 2000 – 2200 man-hours went into the database over five month's time. Of this, approximately half of those hours were for data entry, the rest being used for database management and development. Without the backlog of data to input, data entry alone requires approximately 12 hours per week.

(c) Four data tables were created which contain information on patient demographics, outpatient visits (to the Emergency Room, and Orthopedic, Physical Therapy and Dental Clinics), admissions and dispositions, and operations / anesthetic events[2]. Copies of the database were put on computers located at the main data entry points: Patient Administration, the Emergency Room, and the Operating Suite. The master copy was kept on the computer used by the SysOp for housekeeping chores and further development. Since these computers were not connected over a network, a tremendous effort was required of the SysOp to transfer the entered data between the different computers and to keep the copies synchronized. The alternative was to restrict all data entry to just one machine, which would have created an unacceptable bottleneck. As it was, new records could only be entered in one appropriate outlying computer, and all editing of previously entered data could only be done on the master copy. Therefore, version control was another critical issue for the SysOp[3].

(d) In order to simplify the management of outpatient visit data entry, the initial plan called for all patient contacts with the hospital to be logged in through the ER, who would then refer the patient to the appropriate clinic for treatment. In practice, this plan went by the wayside almost immediately, as the other clinics

[1] ACCESS™ is available either as a separate software package or as part of Microsoft Office Pro™ for Windows™.
[2] The full description of the structure of the database is given in Tab H3. Database Structure.
[3] These issues are discussed in detail in Tab H2. Database Management.

began seeing patients directly and scheduling their own follow-up visits, completely bypassing the ER. This added several levels of complexity to managing the database:

1. Another data entry point for the Outpatient Visits table had to be created, and a change in the numbering scheme developed, in order to allow entry into a single data table from two separate points. It also necessitated further checking to be done to eliminate duplicate entries[4]. The entry of these records was accomplished by setting up another computer for the entry of the backlogged records, so that there would be fewer conflicts for time on the computers. Current records for those clinics are being entered on the Patient Administration computer, since the volume is relatively small; also this avoids having to update a fifth station with new patient data entries.
2. The meaning of 'follow-up visit' had to be redefined from 'More than one visit to the MASH for a given problem', to 'More than one visit to *a particular clinic* for a given problem.' While this allows individual clinics to separate the incidence of an illness from the workload involved in treating the illness, ie., new patients vs. follow-up visits, it introduces an inaccuracy when extracting global MASH data, since a patient can be logged in as having a 'new' problem in more than one clinic[5]. For example, a patient with an injury would present to the ER, be given the initial treatment and referred to the Orthopedic Clinic for follow-up. Subsequently, he might be referred to the Physical Therapy Clinic for rehabilitation. Thus the single injury has generated three 'new' visits. To limit the damage, we deleted the ER record of patients referred to another clinic for initial treatment, as happened often with dental problems. Also, this situation was relatively infrequent, with the exception of referrals between Orthopedics or the ER to Physical Therapy. These referrals account for 25 – 30% of the 'new patient' visits to Physical Therapy, leading to a significant overstatement when reporting global data such as accident reports. This problem had not been worked out at the time the data for this after action report was extracted, and so is reflected in that report.

(e) Another change to the original plan was to separate the entry of the patient demographic data from the entry of the clinical data generated by a visit. There were two reasons for doing this. The first was to simplify the data entry procedure for the ER and other outpatient clinic staff, who had the bulk of the workload, and variable skill levels. The second was to train a smaller number of people in searching techniques and the data entry conventions needed to avoid duplicate entries[6]. This function was taken over by the Patient Administration staff, one of whom learned enough to act as an assistant to the SysOp. Eventually, all patients were signed in at Patient Administration either before or after their visit, which allowed them to verify that the data was complete and correct. The only drawback to this was that moving the information from the PATIENT DATA table on the Patient Administration computer to the outlying data entry points became time sensitive, since no new patient's clinic data could be entered until the table with the patient's demographic information had been updated on that computer. To avoid causing a work stoppage in data entry, these tables were updated every two

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[4] Ibid.

[5] Examples of reports based upon global data are the USAFE/EUCOM, the UNPROFOR, and the Accident Reports.

[6] There are few data entry validations set up in this application to allow easier transfer of records between versions. One such validation forbids duplication of UN ID numbers or of social security numbers for American patients. However, duplications have occurred when spacing conventions between the letters and digits of a UN number were not followed, when the patient's UN ID number has changed, or an American patient was entered once using his UN ID number and a second time using his SSN. Data entry conventions are laid out in Tab H2. Database Management.

or three days by the SysOp. Also, since there was a weekly report due to USAFE / EUCOM, an effort was made to have data entry complete on all current patients by the end of each weekend.

(f) The only exception to the rule that, "editing of previously entered records must be done on the master copy on the SysOp's computer," was with the A&D DATA table. Since an entry could not be completed until the patient was discharged, sometimes weeks later, these records regularly had to be updated. Since the Patient Administration staff was already using one computer to enter all patient demographic data and admissions, and using that computer to search on patient entries during the day, it seemed to make sense to declare that the A&D DATA table on *that* computer was the master copy. Therefore, records in it could be edited in order to add discharge dates and to update the diagnosis and procedures done during the hospitalization. This also provided an additional point at which the data could be reviewed, corrected and categorized. This was technically possible only because this table could be overwritten in the main copy without breaking and reforming joins in the database.

(g) Another problem was encountered when patients were admitted directly from a clinic without an outpatient visit entry having been logged. While it is clear that A&D data belong in a separate table from outpatient visits, there was no consistency to when an entry appeared in both the inpatient and outpatient tables and when not. This made generating reports on global patient clinical statistics impossible, since adding the two tables would lead to overstatement and drawing from the outpatient table alone would be incomplete. This was addressed for the entries of patients seen during this deployment by ensuring that outpatient entries are being generated for all admissions. However, for the prior two deployments the two tables will have to be compared and entries created in the outpatient table where they are missing. Once created, these entries are flagged in the outpatient table as having been admitted, so they can be readily separated out.

(h) A similar problem occurred with the entry of minor procedures done in the OR, such as endoscopy, where admission to the hospital was not required, and no outpatient visit was ever logged through the ER. This was resolved by having Patient Administration admit them as a same-day surgery, and by creating an entry in the outpatient table.

(i) Visits to the Mental Health Clinic were never entered into the database because of confidentiality issues, particularly involving visits by members of the US contingent. A record of these visits was kept on paper, coded by the patient's initials, but containing their social security number. Adding them to the database under their initials would have created duplicate patient entries, but the numbers were small enough to have had a negligible impact. The social security numbers would have had to be changed since the database would not allow duplicates of these, and this could have acted as a flag to determine the total number of duplicate entries. In the end, the psychiatrist, who was a sole provider, decided not to enter these records into the database. He was able to provide a count of the visits for each month which was manually entered into the reports of disease categories to EUCOM and UNPROFOR.

(2) Data categorization

(a) USAFE / EUCOM vs. UNPROFOR / FMEDO categorization schemes. The USAFE / EUCOM categorization scheme was apparently cast in stone. A weekly report of *US patients only*, broken down into these categories was required (see Tab H 1.1) and sent, even though the meaningfulness of such limited data was questioned. For the UNPROFOR report, due monthly (see Tab H 1.2), the SysOp worked with the Assistant Forces Medical Officer to develop a categorization scheme which was more pertinent to this deployment and not totally incompatible

with the EUCOM scheme. As the following table shows, with the exception of eye injuries, each category in one scheme is in its entirety either a subset or a superset of a category in the other scheme. By including all of the category divisions from both schemes, the database can produce summary data which can be used for either report. The EUCOM category of Eye Injuries / Illnesses is the only exception to this since injuries belongs to one UNPROFOR category and illnesses to another. But, because the Eye category is also flagged for injury type according to the UNPROFOR scheme, the database can make the distinction between eye injuries and illnesses. However, this has not been programmed into the reports, since the number of cases is so small that they can be added to the final figures manually. These categories were assigned by the professional staff including the Military Public Health Officer, after the records were entered. Because a level of clinical expertise was required to assign the categories appropriately, this was not left to the technicians.

Tab H1. Patient Database Development

CATEGORIZATION SCHEMES FOR DISEASE / INJURY TYPES		
USAFE / EUCOM	**UNPROFOR / FMEDO**	**COMBINED**
Heat / cold	Climatic Disease	Heat / Cold
Dental	Dental	Dental
Medical Illnesses*	Medical	Other Medical
Dermatological Illnesses		Dermatological Illnesses
Respiratory Illnesses		Respiratory Illnesses
Gastrointestinal Illnesses		Gastrointestinal Illnesses
Fevers of Unknown Origen		Fevers of Unknown Origen
Sexually Transmitted Disease		Sexually Transmitted Disease
	Surgical, Non traumatic	Surgical, Non traumatic
Psychiatric Illnesses	Psychiatric Illnesses	Psychiatric Illnesses
Substance Abuse		Substance Abuse
Orthopedic/Surgical Injuries	Injuries	Injuries
	Major vs. Minor	Major vs. Minor
	Battle Injuries	Battle Injuries
	Gunshot wound	Gunshot wound
	Mine	Mine
	Artillary	Artillary
	Other	Other
	Non - Battle Injuries	Non - Battle Injuries
	Vehicular	Vehicular
	Sports	Sports
	Other	Other
	Alcohol related (yes / no)	Alcohol related (yes / no)
Eye Injuries and Illnesses		Eye Injuries and Illnesses

* Includes non-trauma surgical illnesses

(b) Professional Staff, and other local categorization schemes.

1. Accident identification and determination of causes. An extensive review of all records available was done by the Safety Officer to identify accidental injuries and categorize their causes. The categories used were Falls, Fights, Industrial (work related), Miscellaneous, Motor Vehicle Accidents, Sports

Injuries, and Unknown. Battle injuries were not counted as accidents. The effort that was expended to determine the circumstances surrounding each accident was justified because the information gained was also used to categorize the injury type for the UNPROFOR injury report. The ability to assign categories varied with the amount of information available. Therefore, the data are fairly complete for the 48th, since the technicians were instructed to note the circumstances of the accident when signing the patient in. The data are incomplete for the 502nd, but since the actual medical records are available, the designation of an accidental injury could be determined, and in some cases a cause assigned. Since nothing was available from the 212th but summary logs of the patient visits, the accidental nature of the injury could only be surmised and no causal factors identified.

2. Diagnosis by (sub)specialty or organ system (See Tab H 1.3). These are applied to inpatient diagnoses, by the professional staff, and will be used to group inpatient diagnoses. Since each patient may have many diagnoses, statistics can be generated on all problems treated at this facility, as well as be limited to just the primary diagnosis.
3. Surgical procedure types (See Tab H 1.3). Applied to surgical procedures performed in the OR, to break these down according to surgical specialty or body region regardless of the specialty of the surgeon performing the procedure. These categories are mirrored in the diagnoses categorization in item 2. immediately above
4. Dental Treatment Categories. These were developed by the dentist for use in the outpatient Dental Clinic visit entries. They are applied by the dental technician who does the data entry and verified by the dentist (see Tab H 1.3).
5. ICD-9 coding for inpatient diagnoses and surgical procedures. Fields have been made to enter this data. However, since none of our Patient Administration technicians had any background in coding, these were not entered for the 48th. The 502nd and 212th were able to code much of their information and this has been entered.
6. Reportable Diseases. There are extensive listings of reportable diseases from both EUCOM and the FMEDO's office (see Tab H 1.4), most of which are rarely, if ever, seen here. Therefore, no categorization has been attempted, beyond creating a flag field for noting the occurrence of a reportable disease. Even with such a limited categorization difficulties arise due to lack of data and imprecise terminolgy[7].

(3) Reports

(a) USAFE / EUCOM. Weekly report of diagnostic categories on US patients only. Due to the high frequency of this report, and to the time required to get the data from all of the clinics inputed and checked for omissions and duplications, much of this report was generated by hand counts and are of questionable accuracy. When we questioned the need for sending weekly reports to USAFE Military Public Health office, we were told that the tasking was from EUCOM (or even higher up the chain) and could not be changed. COL Elliot Pearlman, the Deputy Surgeon at EUCOM, was pleased with the reports he was getting. Once the data entry is complete, new copies of the reports will be generated to correct any inaccuracies. At that time, the issues of the frequency of this report, the limitation of US patients only, and the inadequacies of the categorization scheme will be addressed. The goal is to get them to accept the full monthly report based upon

[7] For example: does a diagnosis of Acute Gastroenteritis signify diarrhea, a reportable disease? Is a Flu-like Syndrome an upper respiratory infection with systemic complains?

the combined categories, perhaps with the US patients broken out in a separate report.

(b) UNPROFOR / FMEDO This is a monthly report first due for Dec 1993. It consists of one report of diagnoses grouped by general disease categories, and broken down by new vs. follow-up visits, and another report which categorizes injuries by the scheme in item 2.b.(2)(a) above. As mentioned before, the breakdown of eye injuries vs. illnesses has not yet been automated, but this could be accomplished with a subreport.

(c) Daily Inpatient Report. This report provides a listing of the current inpatients, and was produced each morning for the commander's information, and to be included in the daily Medical Situation Report. Since the criteria used to extract the report is "Date of Discharge is Null," this report can only produce information on current inpatients.

(d) Accident Reports. These reports were produced monthly by the Safety Officer and reported to the Pleso Camp Commandant (see Tab C4.5). They listed the location of the accidents by UN Protected Area in an attempt to follow trends in the entire catchment area of the MASH. A summary report listing monthly totals by category is also available.

(e) Reports for Individual Clinics. The breakdown of numbers of patients seen each month by disease categories can be limited to a particular clinic and a particular time frame.

(f) Other reports. As the data entry nears completion, and after action reports are being written, numerous other reports have been developed, looking at data on medical inpatients, global outpatients, and dental patients.

3. Problems, recommendations, potential improvments

a. Issue — Lack of a networked system.

(1) Discussion. This has been the main limitation to the development of this database and on entering data. The time required to create a pseudo-network using floppy disks severely hampered the development of the database itself, especially when added to the other "housekeeping" chores such as backing up, repairing and compacting the database. Twelve to sixteen hours were spent each week just transferring the data from one machine to another. This was done by the SysOp since the potential for losing data or corrupting the database through the slightest misstep in this process was great. The pseudo-network was also inadequate since it imposed limitations on which machines could be used to enter each type of data and limitations on which machine could be used to edit previously entered records as discussed in item 2.b.(1)(c) above.

(2) Recommendations

(a) Installation of a networked computer system. This would comprise 5 or 6 workstations and a file server on an Ethernet network. This would require buying an Ethernet card for each computer, the cabling to connect them, and multiuser licensed copies of the software program. These requirements have already been addressed with the UNPROFOR Information Technology office, (see Tab H 1.5). While they seemed very positive and willing to provide this system for us, along with a digital tape backup system and training for the persons managing the system, they have not yet even answered the memo we sent them. Follow up with them is needed. The points of contact are Mr. Gary Taylor, Director; Mr. Jim Martin, Computer Network Manager; Mr. Nelson Gui, Systems Engineer. They are located at UNPROFOR HQ, in Zagreb, P.O. Box 870; phone 385 41 180 011 ext 2697.

(b) If this office fails to come through with the required system, it is strongly suggested that DoD buy the necessary cards and software, which should cost $ 2500 – $3000 total. The cabling can be provided through the Harris Corporation, if needed, as they upgrade the phone system. The point of contact for the Harris Corporation is Mr. Carlton Enyedi, Business Manager; local phone 815071 (work), 650960 (home).

b. Lack of a dedicated staff

(1) The Problem. The personnel needs for this project were not understood initially, so the required people were not assigned and trained at the outset. It was left to the SysOp to carry to entire load of coordinating data entry, providing the human conduit for the pseudo-network, performing database cleanup, maintenance and backup, providing the clinical expertise to non-physicians attempting to categorize diagnoses, providing training and troubleshooting help to data enterers, developing data entry forms, reports, and categorization schemes, and incidentally improving the database to correct its weaknesses and make it easier to use; all while learning the software. Asking for help from the administrative staff was akin to begging for a favor since they all had other assigned primary duties, and much of the work was best accomplished after normal duty hours, which made such requests distinctly unpopular. Since data entry was the first priority, the housekeeping chores took precedence.Therefore, the manipulation of the data to produce reports and the further development of the database itself suffered from lack of attention.

(2) Recommendations

(a) Dedicated SysOp to perform database upkeep and maintenance, and management of the network should one become available. A second person should be trained in these skills as a backup since there must be someone with these capabilities available at all times8.

(b) A database developer, who is either a member of the professional staff, or someone who can work closely with the professional staff, to manipulate the data for reports, and who can improve the database in the ways listed in item 3.e.(6)below.

(c) Administrative staff, conversant in medical terminology to coordinate data entry, and ensure accurate, uniform spellings of diagnoses and treatments.

(d) Administrative staff capable of coding records using ICD-9 diagnostic and procedure codes.

(e) Professional staff input for corrections of diagnosis, listing of procedures done, and for categorization of diseases.

c. Issue — Lack of a central point for all patient contacts.

(1) Discussion. As discussed in item 2.b.(1)(d) above, patients enter the system at many different clinic areas, making the likelihood of duplicating records high. This is especially true of patients who are logged into the ER with a problem that is immediately referred to another clinic, such as Dental or Physical Therapy, with no diagnosis or treatment given in the ER. The way the system is currently set up, such a patient would be entered twice on the same day for the same problem. Another form this takes is the patient getting entered twice under different names or UN ID numbers (see discussion under item 2.b.(1)(e) above). We have attempted to address the latter problem by having all patients reporting to Patient Administration either

[8] In fact, the TeleMed system will also require technical support around the clock, especially when the MASH becomes the primary consultation node for the US troops in Macedonia. In that case, it would be wise to have a minimum of three SysOps, trained in both systems; the third to provide coverage during leaves.

before or after their visit to the outpatient clinic, to be entered into the database and receive a Patient Sequence Number by which their demographic data is linked to all other tables in the database. There was some resistance to this idea from the providers and technicians in the clinics, who worried that their patients might become log-jammed in Patient Administration, but this has not proved to be a problem. The ER staff prefers to see and evaluate their patients first, and they have been quite conscientious in directing them to Patient Administration after their visit. The problem of duplicate visit entries has been addressed by periodically sorting the Outpatient Visits table by Patient Sequence Number and manually inspecting the data for duplicate entries9. This is becoming a bit unwieldy with 8000 records to look through, but once the backlog of old records has been entered, the manual search can be limited by date of visit.

(2) Recommendations

(a) Continue the current practice of having all patients report to Patient Administration before their visit, unless they are going to the ER. Ideally, no patient should be logged into a clinic until he has a Patient Sequence Number assigned by Patient Administration.

(b) If a networked system becomes available[10], then the Patient Administration technicians could also start an outpatient visit record and assign a visit number for a particular clinic. The technicians in the clinic could then add the clinical data on the visit at a later time. It is important to have the clinic technicians enter the clinical data, since they have some knowledge of the diagnoses and treatments that the Patient Administration technicians lack.

d. Hardware limitations

(1) The Problem. The database tends to run too slowly on the 386 machines we have available. In fact, it can be brought to a virtual standstill if the 100 Mb hard drive space is used up with other applications, limiting the amount available to Windows'™ virtual memory. However, since computers are in short supply, it is impossible to limit their use to the database alone, so the hard drives are stuffed with word processors, graphics programs, utilities and a moderate number of the smaller games[11]. This also created a problem with access time to the computers, since there was a lot of backlogged records to enter.

(2) Recommendations. Unless the new computers being brought in by the Navy are more powerful or have larger hard drives, the machines used for the database must be primarily dedicated to that purpose. The addition of *one* word processing program, and a few small games is acceptable, but loading several word processors, a graphics program, another database application, and a large graphics oriented game onto the hard drive is not.

e. Other Improvements

(1) There is a need for data entry forms, particularly for tracking accidents and injuries, flagging follow-up visits and admissions, and updating A&D forms with discharge diagnoses and non-operative procedures.

(2) Categorizing reportable diseases and automating the reporting process, as discussed in item 2.b.(2)(b)5. above.

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[9] These issues are discussed in detail in Tab H2. Database Management.

[10] Allowing editing of previously entered records.

[11] We felt it good for the morale of the technicians doing the bulk of the data entry to leave some of the smaller games on the machines. The informal rule was equal time between playing games and entering data.

(3) Setting conventions for diagnoses, i.e., agreed definition of FUO, viral syndrome, AGE, infectious diarrhea, etc. and for categorization, so that immunizations and chronic low back pain are categorized as Medicine, while an acute paraspnious muscle spasm from lifting a heavy object is an Injury (and likely an industrial accident as well).

(4) Verifying the completion of the creation of outpatient records for direct admissions of prior deployments, as discussed in item 2.b.(1)(g) above.

(5) Adding Mental Health entries to the database, as discussed in item 2.b.(1)(i) above.

(6) Further database development. This database is very fragile, since few protections have been built in. It would be very easy for an untrained operator to inadvertently delete or corrupt the data. Making the database bulletproof would have taken more time than we had, and in some cases was intentional to avoid difficulties in transferring data from one computer to another. We compensated for this by continuously reviewing and correcting the data but some of this checking remains incomplete, since old data is still being added.

(a) Protection of referential integrity. The structure of the database is denormalized in several ways, which have not been corrected due to lack of time.

1. Two fields in the A&D records are duplicated in the OUTPATIENT DATA table. These are Primary Disease Category and Battle vs. Non-Battle Injury Type. The data in these fields should be synchronized. Once entries in the OUTPATIENT DATA table are created for those admissions which do not have one, these fields should be deleted from the A&D DATA table.

2. The records of admitted patients in the OUTPATIENT DATA table need to be reviewed to ensure that the 'Admitted?' check box is checked, especially for those records from the prior two deployments.

3. Identification of follow-up visits. This is a crucial flag since failure to check it adds another count to the incidence of an illness, making the reports by disease categories inaccurate. It is often missed on data entry, since not all of the written documents have this information. Standardized data entry sheets should go a long way towards correcting this problem, but this should routinely be watched for and corrected. It would be possible to create a data entry validation to prevent this from occurring, but would not be feasible until the database is put on a network.

4. Manual entry of register number from A&D Form into the OR DATA ENTRY Form. Both the Patient Sequence Number and the admission Register Number have to be entered manually into the OR DATA ENTRY Form, with no validation that these two numbers are related to each other. It would require some exploration of the database capabilities[12] to be able to lookup the register number in the A&D DATAtable, while avoiding duplication of the listed records.

(b) Data entry validation. As the database gets larger, visual searches of all of the entries becomes a less viable option, especially in the PATIENT DATA table, where a search cannot be limited to current entries. However, until the system can be put onto a network, these changes should be made slowly and with great thought.

(c) Addition of a 'Referred' field to the OUTPATIENT DATA table to distinguish initial visits to the MASH for a new problem, from an initial visit to a given clinic

[12] A combined key consisting of Patient Sequence Number and Date of Operation would have to be used to search the A&D DATA table for the proper Register number.

for a problem that has been addressed at another clinic previously (see item 2.b.(1)(d)2. above).

(d) Automation of database functions for end users, to facilitate navigating around the database, performing searches, etc. This would make the training in using the database easier to understand which would allow more people to use it. It would also afford the endusers the ability to be more self sufficient, while keeping them out of the underlying database structure, where they might break something.

4. Significant accomplishments

a. The most important factor contributing to the success of this project was the unambiguous and continuing support for it given by the hospital commander. He made it clear, by his words and actions, that he considered the capturing of the MASH data to be one of the highest priorities of this deployment. Without this level of support, this project could not have been carried out, and cannot be continued, as by its nature, it demands a continuous high level of attention and effort. If it is handled in a perfunctory manner, it would be best not done at all because the quality of the data would rapidly deteriorate into meaninglessness.

b. Database development

(1) Development of the data entry forms for each clinical area: Patient Demographics, Admissions and Dispositions, Operations, and Outpatient Visits for the Emergency Room, Orthopedics, Physical Therapy, and Dental Clinics. Where applicable, these forms include pop-up lists of common diagnoses, treatments, religions, nationalities, providers, diagnostic and accident categories, etc.

(2) Development of categorization schemes and entry forms for diagnostic categories, injury types and causes, accidents and causes, and breakdown of inpatient diagnoses and operations by (sub)specialty.

(3) Development of reports on daily inpatient census, weekly breakdown of diagnostic categories for US patients following the EUCOM scheme, monthly breakdown of diagnostic categories following the UNPROFOR scheme, and monthly analysis of accidents and their causes. The breakdown by diagnostic categories can also be limited to a particular clinic, inpatients alone, and to a specified time frame. Other reports are being developed as the need arises.

c. Data Entry. All available records of patient contacts with the MASH from Nov 92 through the present have been entered. The numbers of records entered are as follows:

Patient Demographic Data	4,865
Outpatient Visits	9,690
Admissions and Dispositions	978
Operations and Anesthetic Episodes	525
Total	16,058

5. Interface with the UN.

a. Dealing with foreign names. The biggest impact that operating in a multinational environment has had on data entry is the difficulty in dealing with names that are not immediately recognizable as such. This has led to numerous duplications of entries into the Patient Data table, and is the strongest argument for having all patients report to the Patient Administration section to be entered into the database directly.

(1) In many cases it is nearly impossible to determine what is what we would call a 'first name' from what we would call a 'last name', especially in those cultures where a person is usually addressed by his given name rather than by his family name. Sticking to what is written on their UN ID card helps, but this is often contradicted by what they call themselves and by what their physicians write on their transfer summaries. This leads to the duplication of entries that is the hardest to detect visually in the database.

(2) The combination of foreign spellings, often using letter combinations not found in English, with the vagaries of interpreting someone else's handwriting, have led to certain patients being entered into the database 4 – 6 times each. The patient Viirtagen was entered as Virtagen, Vurtagen, Virtgen, etc[13]. These duplications can usually be found by sorting the Patient Data table by last name and looking though all of the entries. One advantage to having such unusual names, is that one can also pick up duplications by sorting the table by first names.

b. Lack of uniformity of UN ID numbers[14]. These numbers are generally comprised of 2 or 3 letters followed by 5 or 6 digits. However, the order of letters and numbers might be reversed, or there may be no letters at all and only 3 digits. Some of our patients, like the refugees, had no ID numbers at all, and, as mentioned earlier, the members of the US contingent had both their UN and social security numbers. All of this made automated validation of data entry for this important field next to impossible. This necessitated developing strict conventions to be used when entering these numbers, which are listed in Tab H.2. Database Management. A new twist has just arisen, in that the UN has decided to change the ID numbers of all independent contractor staff to distinguish them from regular UN staff. This change is expected to be completed by the end of March. We are already seeing patients who have been entered in the past under their old number, now returning for medical care under their new number.

6. Moving into Phase II

a. In the first phase of this project, the main concern was entering and validating the vast amount of data, and the bulk of the energy, thought, and resources was devoted to that goal as the content of this document illustrates. However, it is very easy to get caught up in the finicky activities of getting the data in and lose sight of the reason that we do this at all, which is to get the information out.

b. When we first developed this database, we thought about the typical questions one might ask and created fields for data entry accordingly. It wasn't until six weeks after starting to enter the data that other questions started to arise that couldn't be answered by the data we had entered or by the way we had formatted it. In order to produce information on the categories of illnesses seen, or more especially identifying accidents and their causes, we had to modify both the structure of the database and the information we put down in the written record. Then we had to go back to the reco rds we had already entered, and try to find the additional information. Aside from being a lot of extra work, the problem with doing this is that often the information is not there. It was not written down because nobody knew that it was needed.

c. The point of this final harangue, is to stress the need to find out what the questions are now, *not* when it's time for people to write their after action reports. Since this database was conceived as a clinical function more than an administrative one, it is crucial to

[13] Of course, in this case there had to be a concomitant error in entering the UN ID number as well since duplicate ID's are not accepted. This was one of the cases that taught us the need to stick to very precise conventions when entering these numbers.

[14] The term *UN ID* is used loosely here, as there were many members of other non-governmental organizations, as well as civilian employees, each with their own ID cards and numbering schemes.

involve the professional and nursing staff in determining what the questions will be before starting to enter all of the records[15]. They can be reassured that they don't need to be computer literate in order to take part in this, but then again, the people with the questions are the best ones to get to categorize the data to answer those questions.

[15] We have refrained from celebrating with a bonfire of all the old records, in case there was something else one might want to glean from them, although we have picked those bones pretty clean.

[Zagreb Letterhead]

FROM: Maj Janet T. Martino

13 Mar 94

SUBJ: Tab H2. Database Management

TO: After Action Report and Transition Document, 21 Sept 93 – 17 Mar 94

1. Opening the Database. The Windows™ operating system shell must be running in order to use Microsoft ACCESS™. Once in Windows™ go to the Program Manager Applications window. If the Applications window is not showing, you can open it by selecting it in the listing under the Window menu. Once in the Applications window, find the icon for the database. Double clicking this icon will open the database. The name of the icon will vary depending upon which computer you are on.:

   "A&D Database" on the Patient Administration and SysOp's computers.

   "Patient Database" on the ER computer.

   "A&D / OR Database" on the OR computer.

2. Data Entry. All data entry is done from forms, *not* tables. When the database is first opened, the default is to show the listing of tables. The data enterers must be trained to find the proper form. Only the SysOp should ever need to use the tables.

   a. Conventions. The most important factor in avoiding duplications and other errors is consistency in data entry. These are the conventions we entered the data by:

      (1) Names. As discussed in item 5.a. in Tab H.1. there were two major problems in dealing with foreign names, distinguishing 'first' and 'last' names, and getting the correct spelling. Both of these problems were addressed by having a small cadre of people in Patient Administration do all of the entry into the Patient Data table. These technicians understood the importance of getting this right, and were trained to do multiple searches in the LName and FName fields with a variety of likely spellings, as well as searching on Social Security or ID numbers (see item 4.a. below). This actually became easier as time went by and the old mistakes corrected, since fewer mistakes were being made on entry.

      (2) SSN / ID Numbers

         (a) Letters must be separated from the digits by one space, regardless of where they occur.

         (b) All US patients are entered using their SSN, rather than their UN ID's, to facilitate integration with their medical records.

         (c) All SSN's are entered in the format: ###-##-####, using a '-' as a divider.

         (d) Children or spouses of embassy workers without their own number, use their sponsor's number with the appropriate family member code preceding it and separated by a space[1]. Family member codes are not used otherwise.

      (3) Dates. These are usually entered in short form as mm/dd/yy. ACCESS will accept any standard date format, such as 23 Mar 94, and convert it to the short form correctly. However, if the date is entered in the short European format of dd/mm/yy, errors will occur.

      (4) Inpatient Register Numbers. There was no convention established between the 212th and 502nd contingents with respect to register numbers for inpatient records. When

[1] Family member codes: 20 for the sponsor, 30 for the spouse, 01 for the firstborn child, 02 for the second, etc.

we started to input these, we found that there were duplications of this number, so we created the following convention and annotated the paper files accordingly.

(a) For records from the 212th MASH, 20,000 was added to the existing register number.

(b) For records from the 502nd MASH, 10,000 was added to the existing register number.

(c) For the 48th ATH, register numbers start at 31001 and run sequentially upwards[2].

(d) The records were assigned these prefixes based upon the contingent commanding the hospital on the patient's date of admission. The change-over from the 212th to the 502nd occurred on 28 Apr 93; from the 502nd to the 48th ATH on 5 Oct 94, and from 7 Mar 94.

(e) It would be logical to start numbering the records for the Navy at 40xxx.

(5) Abbreviations. The rule is that the only abbreviations allowed are those recognizable by most of the people using the database. Thus, diagnoses such as URI, and AGE are allowed, while ETD (eustachian tube dysfunction) is not. Likewise for treatments where standard drug prescribing abbreviations are allowed. This is one of the advantages of having the technicians in a given clinic enter the data for their own clinic — they know better than most what the providers they work with are talking about. In specialty areas, with a more limited set of diagnoses and treatments, the job of spelling out specialty terminology was made easier by using pop-up menus.[3]

(6) Follow-up Visits. The Follow-up field asks the question with respect to each individual outpatient clinic. Therefore, a patient can be seen for the same 'new' problem in more than one clinic, such as the ER and Physical Therapy (see discussion in Tab H.1 Database Development, item 2.b.(1)(d)2

b. Use of Pop-up Menus. Fields with downgoing arrows next to them have pop-up (or dropdown) menus. Although you can type in one of the choices, or type something else that is not on the menu, it is best to use the menu, even if it slows a fast typist down. Using the menus prevents typographical errors, and ensures that the entry makes sense rather than just a synonym for another choice. If new items need to be entered into the menu, they should be brought to the SysOp's attention so that they may be entered into the menu.

c. Mandatory Fields. In order to maintain referential integrity, the database will not let a record be entered if certain crucial data for the record, such as Patient Sequence Number is not entered. If you try to leave that record, a warning dialog appears saying, "The join is broken by value(s) in fields ... (usually Patient Sequence Number)". This is not a problem when you have just forgotten to enter that piece of data; once it's entered, you can proceed normally. However, often someone will inadvertently activate a blank record by clicking in it somewhere, and then find that they can't leave the record because they haven't entered a patient number. The database gets quite insistent about this, not letting you do anything else until it gets the piece of data it wants. The only way to get out of this is to close the entire form window. The same warning will appear, but now if you click the 'OK' button, another warning about will appear saying, "The record being edited can't be saved. If you close the form, the changes you've made to the record will be lost. Close anyway?". Click on the 'OK' button. The record will be lost, but this is all right, as it is not wanted anyway. Now the form can be opened again, as usual.

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[2]There are some 48th ATH register numbers in the 30xxx range. These are A&D records created for same day surgical procedures.

[3]

d. Patient Data. Use the Patient Data Entry form, Tab H 2.1.

(1) During normal duty hours, patients are sent to Patient Administration Section from the clinics. The patient is asked whether he has ever been seen anywhere in the MASH before. If the answer is no, he can be entered directly and assigned a sequence number without extensive searching. If he has been seen before, the Patient Data table is searched, usually on the SSN or ID number. When the record is found the data is verified, and the Patient Sequence Number written on the form used by the clinc to document the visit. For patients seen after duty hours in the ER, the Standard Form 558's are brought to Patient Administration for patient data entry the next morning. On weekends, the Patient Administration technician on call will enter all of the patients seen through Saturday into the database by Sunday morning. This allows the clinic data to be entered on Sunday in order to be completed for the weekly report, due the following week (see item 5.c. below).

(2) The 558's are sorted into two piles, one for patients never seen at the MASH before and one for patients previously entered. The second pile is returned to the ER at the end of the day, so the clinic record can be entered during the night shift (see section 1.e.(1) below). The pile of new patients' records cannot be entered until the Patient Data table is transferred from the computer in the Patient Administration Section to the one in the ER. This is done by the SysOp who brings those 558's to the ER at the same time.

(3) When a new patient data record is to be entered, the technician goes to the last record to determine the highest sequence number. He then goes to the next, blank record, and assigns the next highest sequence number. As a check, the record number and the sequence number should match[4]

(4) The rest of the data should be entered as indicated.

(5) At the end of a data entry session, or after a significant amount of data has been entered, go to the database listing of macros, choose the 'Trans Tables to XLS' macro and click the Run button. This will create a backup copy of your work.

e. Outpatients.

(1) Emergency Room[5]. Use the Outpatient Visits-Data Entry form, Tab H 2.2.

(a) Patient is signed into the ER on a Standard Form 558, which includes:

1. The patient's demographic data.

2. ER data, such as whether the patient smokes, and the status of his immunizations.

3. Whether this is a follow-up visit for the same problem as a previous visit.

4. If this is an accident, the circumstances surrounding it – the how, when and where of the occurrence.

(b) The provider sees the patient and documents the diagnosis and treatment on the SF 558.

(c) The patient is sent to Patient Administration for a Patient Sequence Number, which is written in on the bottom of the 558. The 558's for patients previously seen at the MASH are returned to the ER at the end of each day, to allow entry of the visit data to be done on the night shift. Every second or third night, depending upon how many records have accumulated and whether it is the end of the week

[4] This is the only table in the database where this is so, since there should always be a one to one relationship between the number of patients and the patient's number.

[5] This would be the first function for which a paper data collection form should be created.

(running Sun – Sat), the SysOp transfers the Patient Data table to the ER computer and brings the 558's of the new patients to the ER for data entry.

(d) Open the Outpatient Visits Data Entry form, go to the last record, and make note of the highest visit number[6]. The next visit number should be one higher[7]. Go a blank record and enter the Patient Sequence Number in the appropriate box. On tabbing out of this box, the patient's name and demographic data should appear in the grey rectangle; check to make sure this is correct. Assign the next visit ID number. Enter the remainder of the data as indicated.

(e) Use the Chief Complaint box only when it adds information not entered elsewhere. There is no need to write "I have a headache" there, when the diagnosis is Headache. However, it is important to use this box to state the circumstances leading to an accident, especially whether it occurred at work or during sports, whether it was alcohol related and/or an MVA; or whether it was a battle injury, and if so, what kind. This should be typed in even though you choose the same information from the Accident Cat pop-up menu.

(f) Other very important boxes to check:

1. Date of visit

2. Time of visit (even an approximation is better than nothing)

3. Follow-up Visit?

4. Admitted?

(g) When you are done, *be sure to mark the 558 as having been entered.* (A lot of time is wasted entering visits twice, then looking for duplicate entries and deleting them). Then file the 558 in the accordion file in the ER[8].

(h) At the end of a data entry session, or after a significant amount of data has been entered, go to the database listing of macros, choose the 'Trans Tables to XLS' macro and click the 'Run' button. This will create a backup copy of your work.

(2) Orthopedics, Physical Therapy, and Dental Clinics. Use the appropriate form[9]:

Ortho Clinc Visits Entry, Tab H 2.3.

PT Clinc Visits Entry, Tab H 2.4.

Dental Clinc Visits Entry, Tab H 2.5.

(a) The system is essentially the same as that of the ER, although these clinics tend to send the patients to the Patient Administration section with the clinic form to get a sequence number before seeing the patient. This allows them to keep the written record in their clinics for later entry of the visit data. Initially, they had a large backlog of data to enter and so were assigned another computer to use. Since that backlog is caught up, we are having them do their data entry on the computer in Patient Administration in the late afternoon and evenings, when there is less chance of time conflicts. The patient demographic data is entered on that

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[6] For all copies of the database, this form is automatically sorted in order of visit number, so that the last record will be the highest. In addition, on the ER copy, only the records below 10,000 are shown, so the ER technicians are not confused by the other clinic entries which use higher visit numbers.

[7] In fact, this is not crucial, as long as it is below 10,000 and not a duplicate. However, the number assigned should not be random, so that one has some idea where the unused numbers lie.

[8] At the end of the month the accordion file is brought to Patient Administration to be available for reference during categorization. The file from the month preceding the just ended month is emptied, the 558's filed away, and the accordion file recycled for the new month..

[9] All of these forms enter data into the Outpatient Data table. Different entry forms are used to allow customized pop-up menus for diagnoses and treatments. The Clinic field also defaults to the clinic for which the form was created.

computer to start with, so they do not have to wait for the PATIENT DATA table to be transferred to another site. *However there is a caveat to using a second or third computer to enter data into the Outpatient Visits table. Since data is being entered into the same table by several non-networked machines, it is crucial that the Visit ID Numbers assigned to each entry are not duplicated, as this Visit ID number is the primary key to that table. If this is not adhered to, data will be lost when the two copies of this table are combined. To get around this problem, only Visit ID Numbers below 10,000 are assigned using the ER computer. Numbers from 10,000 to 14,999 are assigned only from the computer being used for backlogged records, and 15,000 and above from the computer in Patient Administration.*

(b) Open the form for the clinic, go to the last record, and make note of the highest visit number. It should be greater than 15,000. The new visit number should be one higher. Go to a blank record and enter the Patient Sequence Number in the appropriate box. On tabbing out of this box, the patient's name and demographic data should appear in the grey rectangle; check to make sure this is correct. Assign the next Visit ID Number. Enter the remainder of the data as indicated.

(c) Use the Chief Complaint box only when it adds information not entered elsewhere. It is important to use this box to state the circumstances leading to an accident, especially whether it occurred at work or during sports, whether it was alcohol related and/or an MVA; or whether it was a battle injury, and if so, what kind. This should be typed in even though you choose the same information from the Accident Cat pop-up menu. This information should be entered for each follow-up visit as well.

(d) Other very important boxes to check:

1. Date of visit
2. Follow-up Visit?
3. Admitted?

(e) At the end of a data entry session, or after a significant amount of data has been entered, go to the database listing of macros, choose the 'Trans Tables to XLS' macro and click the 'Run' button. This will create a backup copy of your work.

f. Inpatients. Use the A&D form, Tab H 2.6

(1) This form is filled out by the Patient Administration technicians when the patient is admitted. If the patient has never been seen in the MASH before, they first enter him into the PATIENT DATA table and assign a Patient Sequence Number. This is then entered into the appropriate box on the A&D Form. On tabbing out of this box, the patient's name and demographic data should appear in the grey rectangle; check to make sure this is correct. A Register Number is assigned, in the appropriate range (see item 2.a.(4) above), one higher than that of the last admission.

(2) Fill in the remainder of the data as indicated. The admitting diagnosis should be entered. This can be updated to the discharge diagnosis when the patient is discharged or at any time a more definitive diagnosis is reached.

(3) On discharge, the patient's record can be found by searching on the register number and updated with the discharge date, diagnosis, and the procedures performed.

(4) At the end of a data entry session, or after a significant amount of data has been entered, go to the database listing of macros, choose the 'Trans Tables to XLS' macro and click the 'Run' button. This will create a backup copy of your work.

g. Operations. Use the OR Data Entry form, Tab H 2.7.

(1) This form is generally filled out by one of the OR nurses. Because both the Patient Sequence Number *and* the Register Number must be entered, the OR data entry cannot be done until both the PATIENT DATA and A&D DATA tables have been updated on the OR computer. Since the numbers are relatively small, they can be looked up by the OR nurse when entering the records. Another option is to give the operation sheets to the Patient Administration technicians to do the searches and annotate the Patient Sequence Number and the Register Number.

(2) Open the OR Data Entry form, go to the last record, and make note of the highest OR Case Number. The next Case Number is assigned automatically and should be one higher. Go to a blank record and enter the Patient Sequence Number in the appropriate box. On tabbing out of this box, the patient's name and demographic data should appear in the grey rectangle; check to make sure this is correct. Type in the Register Number[10]. The next OR Case Number will be generated automatically, via a counter field. Enter the remainder of the data as indicated.

(3) Each entry comprises one anesthetic episode, regardless of how many procedures are performed. For each procedure, there is a Procedure Type field, that is based upon the type of surgery the procedure was, regardless of the specialty of the surgeon who performed it. The Dx Codes and Procedure Code fields are for ICD-9 codes. Each procedure is attributed to a primary surgeon, who is choosen from a drop-down menu which lists the surgeons in order of the frequency of their operations: Orthopedics, General Surgery, and Oral Surgery.

(4) The Room field is for the location of the procedure, either '1' or '2' for the operating rooms, 'W' for anesthetic procedures done on the ward, and 'ER' for the emergency room.

(5) The Urgency option box allows only one of the choices to be selected. The choices are Emergent, Return Post Emergency, and Planned.

(6) Likewise, the Anesthetic option box allows only one of the choices. If a procedure is started with a lower level of anesthesia, and the anesthesia is changed, the higher level of anesthesia is choosen.

(7) There are several fields for the timing of the procedures. These are agreed upon by the Circulator and Anesthesia.

(a) Anesth Start and End Time: Determined by the time the patient enters to OR until the time he leaves.

(b) Surgery Start and End Time: Measured from the time of incision until the time of wound dressing.

(c) Nursing Start and End Time: The time for setup and cleanup of the procedure.

(8) The OR Staff is chosen from drop-down menus. The choices on the menus can be updated and limited to the current staff. Currently, the Anesthetists fields list only the Anesthesia staff. The Surgical Assist's fields list all of the physicians since any of them may be called upon to assist. The Circulators and Scrubbed sets of fields list all of the OR nurses and technicians. Since the nurses tend to circulate, they are listed first in the menus for those fields. Technicians are listed first in the Scrubbed fields since they are most often scrubbed.

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[10] Some of the OR records do not have a Register Number since the patient was never admitted for what was an outpatient procedure. When this problem was discovered, we started to admit them as a same day surgery, but some of the earlier cases may have slipped through.

(9) At the end of a data entry session, or after a significant amount of data has been entered, go to the database listing of macros, choose the 'Trans Tables to XLS' macro and click the 'Run' button. This will create a backup copy of your work.

3. Categorization. Once the records have been entered and the tables copied back to the SysOp's computer, the various categories can be assigned. *This can only be done at this computer, since once the records have be copied to it, any changes to those records on another computer will be lost.* The only exception to this is the A&D DATA table which must be edited on the Patient Administration computer. Because a certain level of clinical expertise is required to assign the categories appropriately, this should not be left to the technicians. All of the categories should be assigned by either the professional or the nursing staff, with the exception of the accident categories, which were assigned by the safety officer. Of course, assignment of ICD-9 codes requires someone trained or trainable in coding[11]. One caveat when there are several people assigning categories — be sure that they all agree on which diagnoses belong to which category. For example, the EUCOM scheme considers otitis media to belong to the Respiratory category, but we have decided that otitis externa belongs to the Medical category. We do not consider Battle Injuries to be Accidents, but all Non-Battle Injuries are, unless they are self-inflicted[12].

   a. Diagnostic and Accident Categorization. Use the Diagnostic Category-General Entry Form. This form is a limited version of the four outpatient clinics' forms, containing only the information needed to assign the categories.

   b. Primary Diagnostic Category Code. Use the A&D Form. This field is a duplication of the Diagnostic category codes used for the outpatient visits records. It will eventually be deleted when all of the admitted patients have entries made in the outpatient table.

   c. (Individual) Diagnostic Category. Use the A&D Form. This categorization is based upon organ system involvement or by (sub)specialty category. This is independent of the specialty of the primary physician.

   d Surgical Procedure Type. Use the OR Data Entry Form. These categories are applied to surgical procedures performed in the OR, to break these down according to surgical specialty or body region regardless of the specialty of the surgeon performing the procedure.

   e ICD-9 coding. Use the A&D Form for inpatient diagnoses, and the OR Data Entry Form for surgical procedures.

4. Verification and Correction of Entries. In the absence of complete automatic data entry validation, verification of entries must be done by repeated visual inspection of the data. The most common problems were duplication of records in the PATIENT DATA and OUTPATIENT VISITS tables, and omission of entries in the OUTPATIENT VISITS table for patients admitted directly from outpatient clinics. These errors were found by using filters to order the records in a way that would make the errors obvious. This was done using the pertinent forms, usually in the datasheet view.

   a. Patient Data Entry form.

      (1) Sort by each of the following, then inspect the data for duplicate records after each of the four sorts:

         (a) Last Name, then First Name

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[11] We did not have any trained personnel to do this coding, and there wasn't enough time to train and oversee coding of the records for the 48th ATH, so this was not done. The majority of records for the previous two contingents had been coded, and this information was entered.

[12] See Tab F for examples of how the categorization was done for Medical Inpatients.

(b) First Name, then Last Name

(c) ID Number, then by either Last Name or First Name

(d) ID Number, then by Nation, then by either Last Name or First Name

(2) When a duplicate is found, keep the record that has the most complete or accurate data, and add any new data that may be found in the duplicate. Then, remove all data from the duplicate entry, except the Patient Sequence Number. *Do not delete the record entirely*[13]. In the Last Name field, type a space, followed by 'Use # ' followed by the Sequence Number of the record that is being kept. This way, if one looks for the Sequence number of the duplicate, no empty record it will acts as a pointer to the record that actually contains the patient's data. The initial space causes these records to sort out together.

b. Outpatient Visits Data Entry form.

(1) Sort by Patient Sequence Number, then by Date of Visit, then by Time of Visit. When an apparent duplicate is found check the Clinic and Diagnosis fields , since a patient may have been seen at more than one clinic on a given day, for a different problem. In this case, the records are not actually duplicates of each other. If the presenting problem is the same, and the patient was seen in the ER and immediately referred to another clinic for further workup and treatment, there should only be one entry for the referral clinic. The duplicate ER entry should be removed as outlined in the next step. However, if the patient received treatment in the ER prior to being referred to another clinic, then both the ER and referral clinic entries are valid and both should be kept. In this case the Referred box should be checked in the referral clinic entry. Also, see that the Follow-Up box is checked when multiple follow-up visits for the same problem are found (see item 2.a.(6) above).

(2) If a duplicate is found, transfer any new data that may be found in the duplicate to the record that is being kept. Then remove all data from the duplicate entry, except the Visit ID Number. *Do not delete the record entirely*[14]. Enter Patient Sequence Number 21 (a 'dummy' patient record), which will put the phrase 'Leave empty' in the Last Name field. It is particularly important that the Date of Visit, Diagnostic Category, Admitted and Accident? fields are empty or negative in these records[15].

c. Creating Outpatient Visit Entries for Direct Admissions

(1) Open the following query and forms in the datasheet view and size the windows so that the screen is split in three horizontally:

(a) A&D I Outpt query. This query lists all of the admissions, and only those outpatient visits for which there is a match on the Patient Sequence Number field. Therefore, for each patient admitted to the MASH, there is a record created for each of his outpatient visits, listing the last name, date of admission, register number, and date of outpatient visit.

(b) Transfer A&D Info form. This is a copy of the A&D form with the extraneous columns hidden.

(c) Outpatient Visits Data Entry form. This is the standard form used for entering outpatient visit data.

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[13] This is because this Patient Sequence Number has already been written on the paper documentation for an outpatient visit. If someone were to use that document to look up information on that patient, the 'retired' sequence number will still exist and contain the pointer to the correct number.

[14] These 'empty' records can be used by the SysOps when creating outpatient entries for inpatients who lack them.

[15] This will prevent these records from being counted in the summary reports.

(2) Compare the date of admission to the visit dates in the A&D I Outpt query. If there is no match[16] found between the admission date and *one* of the visit dates, then an outpatient visit entry must be created to correspond to the admission.

(3) Search the Transfer A&D Info form by Register Number to find the admission.

(4) In the Outpatient Visits Data Entry form, search for a 'dummy record' by searching in Patient Sequence Number field for # 21. The patient name for the dummy record should read "Leave empty". We generally typed "Duplicate entry" in the diagnosis field, although this is not critical. All other fields should be blank.

(5) Transfer the pertinent data from the Transfer A&D Info form to the Outpatient Visits Data Entry form. Change the Patient Sequence Number from # 21 to the one in the admission record. Check to see that the patient's name that appears is correct. Do *not* change the visit number. Transfer the following data from the admission record to the outpatient visit record (these can be copied and pasted):

(a) Use the date and time of admission as the date and time of visit.

(b) Choose 'Direct Admission' from the pop-up menu for the Clinic field

(c) Enter the diagnosis from the A&D record; the treatment can be entered as "Admit"

(d) Enter the Primary Dx Cat from the A&D record into the Dx Category field in the Outpatient Visits record.

(e) If the value in the Illness Type field in the A&D record is 1, then check the box in the Battle Injury field on the Outpatient Visit record.

(f) Check the Accident box in the Outpatient Visit record where appropriate.

(g) Be sure to check the Admitted? checkbox in the Outpatient Visit record

d. Prostaff Review of Visit entries, A&D records, and Operations. The input of the profession staff in verifying records is critical to the accuracy of the data, particularly since we did not have trained Medical Records Administrators.

(1) Correct spellings of diagnoses and treatments. This is a particular problem with the ER Visits and the inpatient records, due to the number of providers involved and often illegible handwriting.

(2) For inpatient records, it is important that the primary diagnosis is listed first, since this diagnosis is what is categorized. Also, when reports are generated, it is easier to list just the first diagnosis, so doing this will provide the most meaningful report.

(3) Review the inpatient records to ensure that the diagnoses and procedures are complete. A diagnosis of 'multiple trauma' is meaningless for a patient who suffered a fractured mandible, bilateral leg amputations, and who required 8 operative procedures to remove pieces of shrapnel from various wounds after a mine injury.

(4) Assign and verify the disease categories, paying particular attention to the consistency of the assignments.

5. 'Sneaker' Net. The goal of the pseudo-network is to collect the data entered into the outlying computers and bring it all together into the 'master copy' on the SysOp's computer and to transfer the Patient Data information entered into the Patient Administration computer to the outlying machines. This transfer of data is carried out via a skeleton copy of the database,

[16] Sometimes there is a visit entry just a day or two prior to the admission date. In some cases, particularly with admissions for elective surgery, this outpatient visit is the required entry for the admission. This is generally obvious from the diagnosis and treatment information.

called "Trans.mdb" on a floppy disk. Generally, only the four primary data tables are transferred, so you would work only with the database listing of tables.

a. Steps involved. In general, there are three operations involved. The first is copying the A&D DATA table and using it to *overwrite* an earlier version of that table. The second is copying one of the other tables and *appending* it to another copy of the same table. In both of these cases, the tables are copied and pasted in their entirety from and to the database listing of tables, without being opened. The third operation involves opening a table, selecting a subset of the records[17], then *appending* them to a copy of the table. This paste append operation can only be carried out into the table while it is opened.

(1) Patient Administration Computer. Copy the entire A&D DATA table, and the new records from the PATIENT DATA and OUTPATIENT DATA tables onto the Transport Disk.

(a) Open the current copy of the database on the C drive, and put the Transport Disk in the B drive. Select the A&D DATA table from the current copy of the database and copy it, using the Copy command on the Edit Menu. It is also wise to open the table, go to the last record and note down the number of records in the table so that the transfer can later be verified. Close the database using the Close command in the File menu. Open the database "Trans.mdb" from the floppy, again using the File menu. Often the this database is listed at the bottom of the File menu as a recently opened file. It will open showing the listing of tables.

(b) Choose the Paste command from the Edit menu. A dialog box will appear, asking you the name you want to paste the table as, and whether you want to paste the structure only, the structure and data, or to append data to an existing table. Name the table to be pasted 'A&D DATA', *exactly*. Choose to paste both the structure and data[18]. If you have done it correctly you should get another dialog box asking, "Replace existing table 'A&D DATA'?" Click 'Yes'. When the paste is complete, open the A&D DATA table, go to the last record and verify that the transfer is complete.

(c) Close "Trans.mdb". Reopen the current database on the C drive, and open the PATIENT DATA table. Go to the last record and note down the number of records in the table. The Patient Sequence Number should match the total number of records. Select all of the records added since the last transfer and copy them. Close the table. A dialog box will state, "You've copied a large amount of data to the clipboard. Do you want to keep this data on the clipboard?" Click 'Yes', then close the database.

(d) Open "Trans.mdb" and the PATIENT DATA table. From the Edit menu, select Paste Append. This will append the previously copied records to the table. A dialog box will tell you,"You've just pasted ....record(s). Choose OK to save your changes or Cancel to undo your changes." Click 'OK'[19]. Check the highest Patient Sequence Number to verify complete transfer. Close "Trans.mdb".

(e) Reopen the current database on the C drive, and repeat steps (c) and (d) with the OUTPATIENT DATA table. These are the outpatient visits entered by

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[17] It is useful to keep a running list of the last record copied for each table, so only the records entered since the last data transfer can be selected.

[18] This is the only time in this process that you will choose this option, in order to overwrite the old A&D DATA table with the new one. *All* of the other transfers will use the 'Append data' option.

[19] If you inadvertently try to paste append a duplicate record, you will get an error message which says it can not be done. In this case, click the 'OK' button. You may also choose to suppress further error messages if many duplicate records were chosen for appending. At the end of the paste append, another dialog box will appear saying that the duplicate records will be put into a table called 'Paste Errors.' Creating this table takes forever, so it is best to avoid this situation by keeping track of which records have already been transferred.

Orthopedics, Dental and Physical Therapy clinics, using Visit Numbers which are greater that 15,000.

(f) When the transfers are complete, go back to the database on the C drive. Go to the listing of Macros, choose the 'Trans Tables to XLS' macro, and click on the 'Run' button. This will dump all of the data in the four primary tables into Excel files on the C drive, in the A&D directory.

(2) Emergency Room Computer. Append the new records from the ER database OUTPATIENT DATA table onto the Transport Disk, and copy the PATIENT DATA table from the Transport database to the ER database.

(a) Open the current copy of the database on the C drive, and put the Transport Disk in the B drive. Open the OUTPATIENT DATA table, and go to the highest record with a Visit ID Number less that 10,000[20]. Make note of both the record number and the Visit ID Number of this record. Select all of the records added since the last transfer and copy them. Close the table and the database.

(b) Open "Trans.mdb" and the OUTPATIENT DATA table. From the Edit menu, select Paste Append. This will append the previously copied records to the table. Check the highest Visit ID Number to verify complete transfer. Close the OUTPATIENT DATA table.

(c) While in "Trans.mdb", select and copy the entire PATIENT DATA table. Do not open the table to do this, just select it from the database listing of tables. Close "Trans.mdb".

(d) Reopen the current database on the C drive and choose Paste from the Edit Menu. A dialog box will appear, asking you the name you want to paste the table as, and whether you want to paste the structure only, the structure and data, or to append data to existing table. Choose the 'Append data to existing table' option and type in the name of the existing table; in this case, PATIENT DATA. *Do not choose any of the other paste options as these will overwrite the existing PATIENT DATA table*[21]. A dialog box may appear stating "Errors were encountered copying data: The contents of fields in 0 record(s) were deleted, and [a certain number of records] were lost due to key violations. Proceed anyway?" Do not worry, the discarded records are duplicates, and not needed. Click 'OK'. Open the PATIENT DATA table, go to the last record and verify that the transfer was complete. Make sure that the highest Patient Sequence Number is equal to the last record number. Close the table.

(e) When the transfers are complete, stay in or go back to the database on the C drive. Go to the listing of Macros, choose the 'Trans Tables to XLS' macro, and click on the 'Run' button. This will dump all of the data in the four primary tables into Excel files on the C drive, in the A&D directory.

(3) Operating Room Computer. Append the new records from the OR database OPERATIONS table onto the Transport Disk, and copy the PATIENT DATA and A&D DATA tables from "Trans.mdb" to the OR database.

(a) Open the current copy of the database on the C drive, and put the Transport Disk in the A drive. Open the OPERATIONS table, and go to the last record. Make note of both the record number and the OR Case Number of this record. Select all of the records added since the last transfer and copy them. Close the table and the database.

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[20] This is because all outpatient visits entered by the ER are assigned visit numbers from 1 – 9999.

[21] This append step will combine the entire table that was copied with the existing table, rather than just a subset of records. However, if the copied table contains records that are duplicates of those in the existing table, based upon the primary key value, (Patient Sequence Number, in this case), these copied records will be discarded.

(b) Open "Trans.mdb" and the OPERATIONS table. From the Edit menu, select Paste Append. This will append the previously copied records to the table. Check the highest OR Case Number to verify complete transfer. Close the OPERATIONS table.

(c) While in "Trans.mdb", select and copy the entire PATIENT DATA table. Do not open the table to do this, just select it from the database listing of tables. Close "Trans.mdb".

(d) Reopen the current database on the C drive and choose Paste from the Edit Menu. The dialog box will appear, asking you the name you want to paste the table as, and whether you want to paste the structure only, the structure and data, or to append data to existing table. Choose the 'Append data to existing table' option and type in the name of the existing table; in this case, PATIENT DATA. *Do not choose any of the other paste options as these will overwrite the existing PATIENT DATA table.* A dialog box may appear stating "Errors were encountered copying data: The contents of fields in 0 record(s) were deleted, and [a certain number of records] were lost due to key violations. Proceed anyway?" Do not worry, the discarded records are duplicates, and not needed. Click 'OK'. Open the PATIENT DATA table, go to the last record and verify that the transfer was complete. Make sure that the highest Patient Sequence Number is equal to the last record number. Close the table and the database.

(e) Reopen "Trans.mdb", select and copy the A&D DATA table. Close "Trans.mdb" and reopen the database on the C drive. Paste the table under the name A&D DATA, choosing the 'Paste both structure and data' option, in order to overwrite the original table.

(f) When the transfers are complete go back to the database on the C drive. Go to the listing of Macros, choose the 'Trans Tables to XLS' macro, and click on the 'Run' button. This will dump all of the data in the four primary tables into Excel files on the C drive, in the A&D directory.

(4) SysOp Computer. Copy the A&D, PATIENT DATA, OUTPATIENT DATA AND OPERATIONS tables from the Transport Disk to the master copy of the database on the C drive.

(a) With the Transport Disk in the A drive, open "Trans.mdb". Select the A&D table and copy it. Close "Trans.mdb", and open the master copy of the database on the C drive.

(b) Choose the Paste command from the Edit menu. A dialog box will appear, asking you the name you want to paste the table as, and whether you want to paste the structure only, the structure and data, or to append data to existing table. Name the table to be pasted "A&D DATA", *exactly*. Choose to paste both the structure and data. If you have done it correctly you should get another dialog box asking, "Replace existing table 'A&D DATA'?" Click 'Yes'. When the paste is complete, open the A&D DATA table, go to the last record and verify that the transfer is complete.

(c) Close the master database, and reopen "Trans.mdb". Select the PATIENT DATA table and copy it. Close "Trans.mdb".

(d) Reopen the master database on the C drive and choose Paste from the Edit Menu. A dialog box will appear, asking you the name you want to paste the table as, and whether you want to paste the structure only, the structure and data, or to append data to existing table. Choose the 'Append data to existing table' option and type in the name of the existing table; in this case, PATIENT DATA. *Do not choose any of the other paste options as these will overwrite the existing PATIENT DATA table.* A dialog box may appear stating "Errors were encountered copying data: The contents of fields in 0 record(s) were deleted, and [a certain number of

records] were lost due to key violations. Proceed anyway?" Do not worry, the discarded records are duplicates, and not needed. Click 'OK'. Open the PATIENT DATA table, go to the last record and verify that the transfer was complete. Make sure that the highest Patient Sequence Number is equal to the last record number. Close the table.

(e) Repeat steps (c) and (d) above for the OUTPATIENT DATA, and OPERATIONS tables, being sure to open each table after pasting to verify that the transfer is complete.

(f) When the transfers are complete go back to the database on the C drive. Go to the listing of Macros, choose the 'Trans Tables to XLS' macro, and click on the 'Run' button. This will dump all of the data in the four primary tables into Excel files on the C drive, in the A&D directory.

b Implications of appending records. With the exception of the A&D DATA Table, all data transfers are accomplished by appending new records to the tables in the master copy of the database. The process of appending transfers only new records. Previously entered records are not affected. This carries two major implications for the management of the database:

(1) Once transferred to the master copy of the database, previously entered records can only be edited on that copy. This is because when appending a table to the master copy, duplicate records, as determined by comparing the primary key field, are discarded, even if other fields in the record have been changed.

(2) When deleting duplicate records the primary key field for that record should not be deleted. If it is, the record will be regenerated when a copy of the table from another computer is appended. Instead, the primary key field is kept and a 'dummy' record is created, as outlined in item 4. above. The primary keys for the data tables are Patient Sequence Number for the PATIENT DATA table, Visit ID Number for the OUTPATIENT DATA table, Register Number for the A&D DATA table, and OR Case Number for the OPERATIONS table.

c. Timing of data transfer. Since there is no real network, the transfer of data from one computer to another is episodic rather than continuous. Therefore, the SysOp must be aware the status of data entry at each station before spending the 2 – 3 hours required to synchronize the data across the stations. It is also important that the data enterers understand the need to coordinate their work with the data transfer schedule. For example, in order to produce the weekly (Sunday through Saturday) EUCOM report of numbers of patients by disease categories, the steps outlined below must occur, and in the proper timeframe. If the processing of just a few records is delayed, for instance, because the hard copy of the visits was misplaced, the entire report is either inaccurate or delayed while additional data transfers are done. Generally, we performed data transfer, followed by a full backup (described in item 6. below) every Sunday, Tuesday, and Thursday.

(1) Patient Data entries must be made for all new patients, and sequence numbers looked up for all old patients seen through 2400 hours on Saturday. This is generally completed by Sunday morning.

(2) The visit data for the patients seen in the Orthopedics, Physical Therapy and Dental clinics must be entered in the Patient Administration computer. This is generally completed by Saturday.

(3) The SysOp must transfer the PATIENT DATA table to the ER computer, before the visit data for the new patients can be entered. This is usually done on Sunday afternoon.

(4) The visit data is then entered by the ER staff. The timing of this is dependent upon who is scheduled to work in the ER, since not all of the ER staff has proved capable

of, or willing to do, data entry. Usually, this is accomplished by Monday morning or Monday night.

(5) The SysOp must then transfer the OUTPATIENT DATA table from the ER computer to the master copy of the database on the SysOp's computer[22]. This is generally done on Monday evening, although may have to be put off until Tuesday if there has been some delay in the previous steps.

(6) The data tables are then checked and verified, to remove duplicates, and correct omissions due to direct admissions.

(7) Concurrent with step (6), the entries are reviewed and disease categories assigned. Even though the EUCOM report is limited to the US patients, all of the entries are categorized, since these will be needed for the monthly UNPROFOR report. Where possible, accident categories for injuries are also assigned, although these are not finalized until the end of the month, since this often requires review of the written documentation.

(8) At this point the EUCOM report can be generated. The data is fairly accurate by this time, although changes in categories occasionally occur due to errors found when the data is reviewed again in preparation of the monthly UNPROFOR and Accident reports.

6. Backing Up, Compacting and Repair of the Database.

   a. Use of the Transfer Macro. Microsoft ACCESS stores all of the data in one database file, making it difficult to recover the data if that file becomes corrupted[23]. Therefore the macro 'Trans Tables to XLS' was written. Its function is to create a basic, text-level backup of the data tables, separate from the database file itself. This is done by dumping the four main data tables into four text files for Microsoft Excel. These tables are named: 'a&d_data.xls', 'or_data.xls', 'outptdat.xls', and 'patient_data.xls'.They are located in the A&D directory which is in the ACCESS directory on the C: drive.The data enterers are instructed to run the macro after a session of data entry, to protect their work until the SysOp can transfer the data to the master copy and back it up to floppy disks.

   b. Compacting and repairing the database. Once the master copy of the database has been updated, it will need to be compacted, since the process of pasting tables and appending records tends to generate a large amount of unused space. Also the process of compacting allows a copy of the database to be made under a new name which facilitates version control, and allows the repair of the database to be done on a copy, rather than the original. As described in item 5.c. above, this is done approximately every other day.

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[22] In practice, each of the data transfers described involves complete synchronization of the copies of the database on the Patient Administration, ER, and SysOp's computers, rather than the transfer of isolated tables. This is done in order to avoid having to keep track of what version of which table is currently on which computer. Not only would this be an organizational nightmare, but the potential for a data-losing error is too great. With the current system, all data transfer, except for the OR, is done by the procedure outlined in item 5.a. above. Updating the computer in the OR can be done less frequently, usually once per week, because of the relatively low volume of data.

[23] We had the occasion recently to use the macro to recover all of the A&D DATA table. This table was corrupted at the end of the workday, just before a routine backup was due, so two full days worth of data entry and corrections were at stake. This occurred because a second copy of ACCESS and the database was opened in memory, and the people working on these copies, alternately modified the same table. One person was altering the primary key field of the table, which caused the program to tie itself into knots when it tried to rationalize the changes being made. While the table could not be opened, or otherwise manipulated, the macro was able to dump its contents to an Excel file. This file was then imported back into the database, and the data restored (see item 7. below for a escription of this procedure).

(1) After all of the data from the outlying databases have been transferred into the master copy on the SysOp's computer, close the database, using the Close command on the File menu. Then, from the same menu, choose the Compact Database ... command.

(2) A dialog box will appear, asking which database to compact. Choose the most current copy. Another dialog box will appear, asking which file to compact the database into. Type in the name of the new database to be created (see item 6.c. below for naming conventions).

(3) After the compacting is completed, choose the Repair Database ... command from the File menu. A dialog box will appear asking which file to repair. Choose the newly compacted copy.

c. Version Control. With multiple versions of the database in various stages of completeness on different computers, it would take a herculean effort to keep track of which version was where. To avoid having to do this, version control conventions are applied only to the master copy of the database on the SysOp's computer. Other copies on the other computers are considered to be incomplete and different from other copies, regardless of which version name these copies carry.

(1) Naming convention. The database is named 'A&D<ddmmm>.mdb', where <ddmmm> represents the date on which the database was compacted, with a leading zero for the day and the month represented by the standard three letter abbreviation, for example: A&D06Mar.mdb.

(2) *The most important action to take once a new copy of the database has been named is to change the properties setting for the Windows Program Manager icon which the data enterers use to access the current copy of the database, for editing and assigning disease catergories.* If this is not done, then all of the modifications will be done to the wrong copy of the database and will have to be redone, as there is no way of automaticlly transferring the modifications of existing records to the most current copy of the database.

d. Backing up to floppy disks. Currently, the compacted database is approximately 3.6 Mb, requiring 3 high density floppy disks for backup. Three complete backup sets are rotated. The backup is accomplished using the DOS 5.0 'backup' command. The command line is:

Backup C:\ACCESS\A&D\A&D<ddmmm>.mdb A:

where "<ddmmm>" symbolizes the correct date according to item 6.c.(2) above[24].

e. Updating Outlying Data Entry Stations. Periodically, especially when a significant amount of structural development of the database was done, new copies of the database were put onto the outlying computers. Obviously, data entry would have to have been suspended between the time that the data was transferred from the outlying computer to the master copy, and the time that the new copy of the database was restored to the outlying computer. This was accomplished by restoring the latest backup copy from floppy disks, using the DOS command line:

Restore B: C:\ACCESS\A&D*.*[25]

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[24] The pathname for all copies of the database on all of the computers was kept uniform to allow the 'restore' command to be essentially the same The only difference between the computers we currently have is the floppy disk drive designation.

[25] Ibid.

(1) *Remember to update the Properties setting under the File menu for the Windows Program Manager icon which the data enterers use to access the current copy of the database, in order to prevent data entry into an older version.*

(2) Be sure that the Outpatient Visits Data Entry form used on the ER copy is limited to only showing records with Visit Numbers less than 10,000, (see footnote 20).

f. Housekeeping

(1) Cleaning Up Hard Drives. In order to conserve hard disk space on the outlying computers, to allow faster operation of Windows and the database, older versions of the database were deleted from these computers after it was clear that there were no problems with the updated copy.

(2) Cleaning up Program Manager windows. A continuous effort was required to keep an arrangement of Program Manager windows and icons which made the location of the database icon obvious to the non-Windows™ literate users. No amount of exhortation prevented others from changing the layout. These transgressions were compounded by these users also enabling the 'Save settings on exit' command on the Windows Options menu. Therefore, the appropriate Program Manager windows and icons arrangement would periodically have to be restored.

7 Recovering data from .XLS backup files. Should one of the data tables or the entire database become corrupted, the data entered can be recovered by importing the Excel™ files created by the 'Trans Tables to XLS' macro.

a. Go to the File menu and choose the Import command. A dialog box will appear asking for the format of the data source to be imported. Choose Microsoft Excel. Another dialog box will appear, showing a list of files whose names end in '.XLS'. Choose the table to be restored. (see item 6.a. above). Another dialog box will appear, giving the following options:

(1) Checkbox: "First Row Contains Field Names". Click this box to indicate 'yes'.

(2) Table Options: Either "Create New Table" or "Append to Existing Table: (Type in name of existing table)". The option you choose here depends upon whether you have an intact copy of the structure of the table. The structure of the table can be copied from an older, intact copy of the database and pasted into the current database without the data. If you choose to do that, then choose the "Append to Existing Table:" option. This is the preferred way to reconstruct the table, as this will preserve the field descriptions and the specific field lenghts assigned when the table was developed. Alternatively, you can choose to create the table de novo, by choosing that option, but you should then go into the design view and retype the field descriptions, and readjust the field lenghts[26].

b. Once the table has been reconstructed, a dialog box will tell you how many records have been imported, and how many errors were encountered (there shouldn't be any). You will then have to reenter any records entered since the last time the 'Trans Tables to XLS' macro was run.

8. Final Word. It should be obvious from reading this section that much of the care and feeding of this database and the pseudo-network requires an extraordinary attention to detail and precise following of instructions on the part of all who work with it, regardless of their capabilities. Therefore, it is essential that the SysOp or an assistant be continuously available for troubleshooting, and open to answering questions, to avoid fatal, data-threatening errors.

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[26] This information can be found in Tab H 3. Database Structure.

'ab H 2.1 Patient Data Entry Form

Patient Data - General Information

Sequence No:	1				
Last Name:		**First Name:**		**MI:**	
Epithet:		**Title:**	SGT	**Grade:**	E5
Sex:	m	**DOB:**	1/1/70		
SSAN:	/	**Nationality:**	FR		
Married:		**Religion:**	UN	**Race:**	
Branch:	A	**Corps:**			
Org:	French Army, Log Bat	**Address 1:**	Camp Pleso		
		Address 2:			
		City:			
		State/Province:			
		Postal Code:			

Look-up Tables for Diagnoses and Treatments

Dental Diagnoses	Dental Treatments	Treatment Category	Treatment Cat Code #
Caries	Pulpotomy	Endo	3
Fracture	Pulpectomy	Endo	3
Irreversible Pulpitis	Obturation - Anterior	Endo	3
Reversible Pulpitis	Obturation - Bicuspid	Endo	3
Necrotic Pulpitis	Obturation - Molar	Endo	3
Acute Apical Periodontitis	Apicalectomy	Endo	3
Chronic Apical Periodontitis	Simple Extraction	OrSurg	2
Acute Apical Abscess	Soft Tissue Extraction	OrSurg	2
Chronic Apical Abscess	Partial Bony Extraction	OrSurg	2
Gross Caries	Full Bony Extraction	OrSurg	2
Impacted	Root Tip Extraction	OrSurg	2
Partial Impaction	Biopsy	OrSurg	2
Non-Functional	Prophylaxis/ Type 2 Exam	Prevent	6
Non-Restorable	Scaling	Perio	4
Chronic Periodontitis	Root Planing	Perio	4
Chronic Gingivitis	Crown Lenghtening	Perio	4
Acute Periodontal Abscess	Composite Filling	Restor	1
Chronic Periodontal Abscess	Amalgam Filling	Restor	1
Odontogenic Infection	Glass Ionomer Filling	Restor	1
Maxillofacial Fracture	Temporary Filling	Restor	1
Pericoronitis	Recementation	Restor	1
Prophylaxis / Type 2 Exam	Antibiotic	Drug	5
	NSAIA	Drug	5
	Narcotic	Drug	5
	Incision & Drainage	OrSurg	2

Tab H 1.3.10 Database Structure - Diagnosis, Procedure, Treatment, and Urgency Categories

Inpatient Diagnostic Categories

Organ System Category	Organ System Cat Code
Abdominal Surgery	Abdo Surg
Allergy/Immunology	Aller
Anesthetic	Anesth
Burns	Burns
Cardiovascular	Card
Dermatologic	Derm
Ear, Nose, Throat	ENT
Endocrine	Endocrine
Endoscopy	Endoscope
Gastrointestinal	GI
General Surgery	Gen Surg
Hematologic	Heme
Infectious Disease	ID
Nephrologic	Renal
Neurologic	Neuro
Neurosurgical	Neurosurg
Obstetrical/Gyn	OB/GYN
Oncol	Oncol
Ophathmologic	Ophtho
Oral Surgery	Oral Surg
Orthopedic	Ortho
Other/Unclassified	Other
PostOp Care	PostOp
Psychiatric	Psych
Pulmonary	Pulmon
Rheumatologic	Rheum
Thoracic Surgery	Thor Surg
Urologic	Urol
Vascular Surgery	Vasc Surg

Surgical Procedure Categories

Procedure Type	Proced Type Code
Abdominal	Abdo
Anesthetic	Anes
Burn	Burn
Ear, Nose, Throat	ENT
Endoscopic	Endo
General	Gen
Genitourinary	GU
Neurosurgical	Neuro
Obstetrical	OB
Oral Surgical	Oral
Orthopedic	Ortho
Plastic	Plast
Thoracic	Thor
Vascular	Vasc

Dental Treatment Categories

Drug Therapy
Endodontic
Oral Surgery
Preventative
Periodontic
Restorative

Dental Urgency Categories

Urgent
Non Urgent Acute
Elective

Tab H 2.2 Outpatient Visits Entry Form

Outpatient Visits Data Entry

Patient Number: 0 Visit Number: 0

Last Name: First Name: MI: Epi:
Title: Grade: Sex:
Birthdate: SSAN: Nationality:

Date of Visit: Time of Visit: Clinic: ER Provider:
Smokes: Flu up to date: Tetanus up to date: Follow-up / Repeat Visit?

Chief Complaint: Accident? Accident Cat:
Diagnosis1: DCode1: Dx Category:
Diagnosis2: DCode2: Reportable Disease?
Diagnosis3: DCode3: Admitted?
Treatment1:
Treatment2:
Treatment3:
Treatment4:
Treatment5:

Tab H 2.3 Ortho Clinic Visits Entry Form

Ortho Clinic Visits Entry

Patient Number: 0 Visit Number: 0

Last Name: First Name: MI: Epi:
Title: Grade: Sex:
Birthdate: SSAN: Nationality:

Date of Visit: Time of Visit: Clinic: OR Provider:

Accident? Follow-up / Repeat Visit? Referred from another clinic for the same problem?:

Accident Cat: Admitted?

Chief Complaint:

Diagnosis 1: DCode1:
Diagnosis 2: DCode2:
Diagnosis 3: DCode3:

Treatment 1:
Treatment 2:
Treatment 3:
Treatment 4:
Treatment 5:

Tab H 2.4 PT Clinic Visits Entry Form

PT Clinic Visits Entry

Patient Number: 0 Visit Number: 0

Last Name: First Name: MI: Epi:
Title: Grade: Sex:
Birthdate: SSAN: Nationality:

Date of Visit: Time of Visit: Clinic: PT Provider:

Accident? Follow-up / Repeat Visit? Inpatient?

Accident Cat: Referred from another clinic for the same problem?:

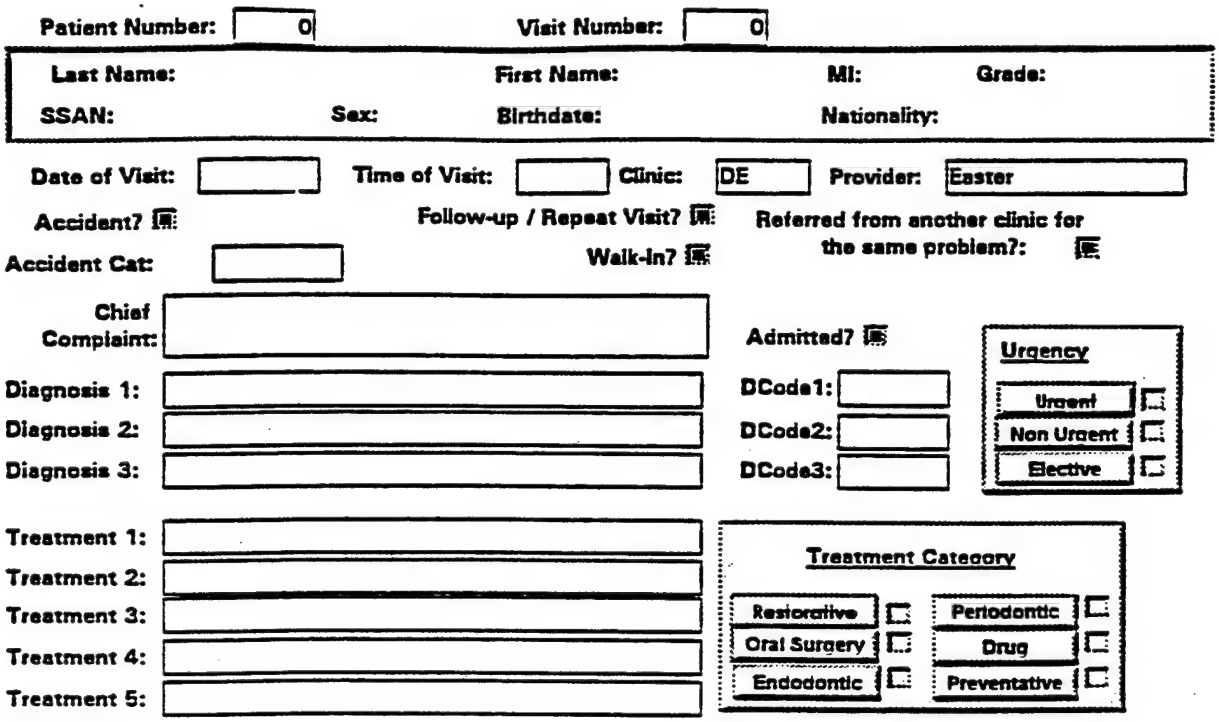
Chief Complaint:

Diagnosis 1: DCode1:
Diagnosis 2: DCode2:
Diagnosis 3: DCode3:

Treatment 1:
Treatment 2:
Treatment 3:
Treatment 4:
Treatment 5:

Tab H 2.5 Dental Clinic Visits Entry Form

Dental Clinic Visits Entry



Tab H 2.6 A and D Form

Admission and Disposition Form

Register Number: 0 Patient Number: 0

LName: FName: MI: Epi: Title: Grade:

SSN: Sex: DOB: Nationality: Race: Religion: Married:

Branch: Corps: Org: Address1:

Date of Admission: Date of Discharge: Death:

Time of Admission: Time of Discharge: SI/VSI:

D/C Clerk: Reportable Disease?:

Primary Provider:

Illness Type

Battle Injury

Disease

Non Battle Injury

Diagnoses: Dx Category: Dx Code:

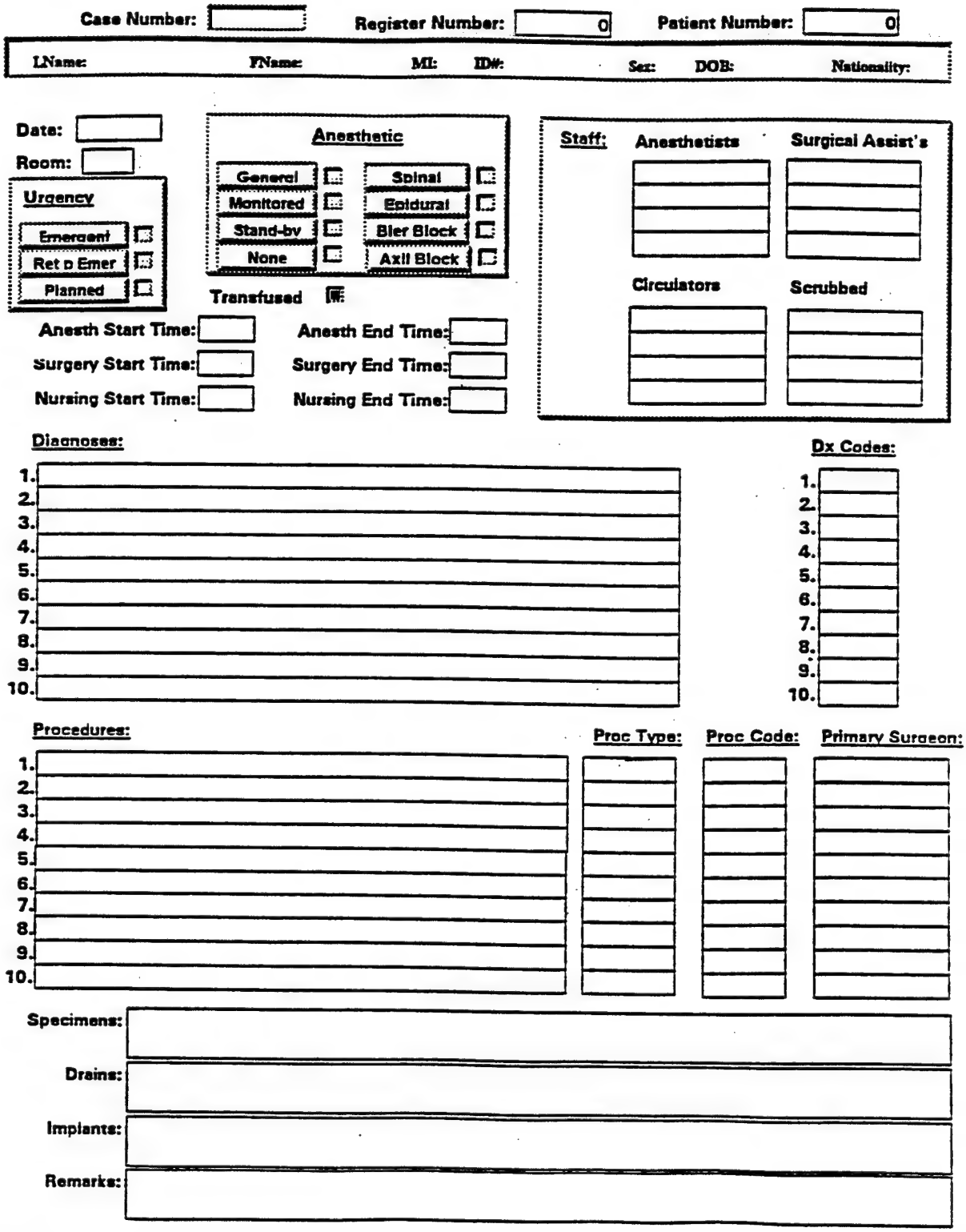
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

Procedures: Proc Codes:

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

Tab H 2.7 OR Data Entry Form

OR Log



List of Tables

A&D DATA
Accident Categories
Anesthetic Types
Battle Injury Type
Clerks
Clinics
Dental Diagnoses
Dental Treatments/Cats
Dental Urgency Categories
Diag Cats-General
Diagnosis Organ System
Illness Type
Nations
Non-Battle Injury Type
OPERATIONS
OR Staff
OR Urgency Categories
Ortho Diagnoses
Ortho Treatments
OUTPATIENT DATA
PATIENT DATA
Providers
PT Diagnoses
PT Treatments
Religions
Surgical Procedure Types

Tab H 3.1.1 Database Structure - Patient Data Table

PATIENT DATA TABLE				
Field Name	**Type**	**Lengt**	**Indexed**	**Comments**
SeqNo	Integer	2	PrimaryKey	Unique Patient ID Number
LName	Text	25	Indexed	Patient's Last Name
FName	Text	15		Patient's First Name
MI	Text	5		Patient's Middle Initial
Epi	Text	15		Epithet, ie., nickname
Title	Text	10		Title, ie., SGT, CPT, Mr., Ms.
Grade	Text	2		Military Grade, ie., E5, O4
Sex	Text	1		M or F
DOB	Date/Time	8		Patient's birthdate
SSAN	Text	15	Indexed	Service ID, eg., social security #, UN ID #
Nationality	Text	2	Look-up Link	2-letter country code (Nations Table)
Race	Text	5		Race or ethnic group
Married	Text	1		Married? Y, N, or U
Religion	Text	2	Look-up Link	2-letter religion code (Religions Table)
VIP	Yes/No	1		Very Important Person? Y or N
Civilian?	Yes/No	1		Civilian? Y or N
Branch	Text	3		Branch of Service- A for Army, AF for Air Force, etc.
Corps	Text	5		
Org	Text	25		Battalion, eg., NEPBAT, JORBAT, RUSBAT, etc.
Address1	Text	50		Local location
Address2	Text	50		Home address, primarily for US contingent
City	Text	25		City
State	Text	25		State, County, or Province
Country	Text	50		Country
Postal	Text	10		Postal Code
Input Clerk	Text	5	Look-up Link	Clerk inputing this data (Clerks Table)

Tab H 3.1.2 Database Structure - Outpatient Data Table

OUTPATIENT DATA TABLE				
Field Name	**Type**	**Length**	**Indexed**	**Comments**
ID	Integer	2	PrimaryKey	Visit ID Number
PatientNo	Integer	2	Indexed	Linked to Patient Sequence # in Patient Data
DOV	Date/Time	8	Indexed	Date of Visit
TOV	Date/Time	8	Indexed	Time of Visit
Clinic	Text	2	Look-up Link	Clinic where patient was seen (Clinics Table)
Provider	Text	20		Provider responsible for the patient
Smokes	Text	1		Initial letter of [yes, no, or unknown]
Flu	Text	1		Flu shot up to date? [y,n,or u]
Tetanus	Text	1		Tetanus shot up to date? [y,n,or u]
Reportable Disease?	Yes/No	1		Is the diagnosis a reportable disease?
Accident?	Yes/No	1		Was the injury an accident?
Accident Category	Text	10	Look-up Link	Type of accident (Accident Categories Table)
Chief Compiaint	Memo	0		Reason for visit; circumstances of accident
Diagnosis1	Memo	0		First Diagnosis
DCode1	Text	10		ICD-9 Code, First Diagnosis
...				...
Diagnosis3	Memo	0		Third Diagnosis
DCode3	Text	10		ICD-9 Code, Third Diagnosis
Treatment1	Memo	0		First Treatment
...				...
Treatment5	Memo	0		Fifth Treatment
Diagnostic Category Code	Text	5	Look-up Link	Category of diagnosis (Diag Cats-General Table)
Follow-up	Yes/No	1		Follow-up to this clinic for the same problem?
Battle Injury?	Yes/No	1		Was it a battle injury
Major Injury?	Yes/No	1		Was it a major injury-requiring admission or operation
Ophthalmic?	Yes/No	1		Was it an eye injury
ETOH Related?	Yes/No	1		Was injury alcohol related on the part of the UN member
BI Type	Byte	1	Look-up Link	Mechanism of battle injury (Battle Injury Type Table)
NBI Type	Byte	1	Look-up Link	Mechanism of non battle injury (Non-Battle Injury TypeTable)
Admitted?	Yes/No	1		Was patient admitted?
Urgency	Byte	1	Look-up Link	For dental entries only (Dental Urgency Categories Table)
Walk-in?	Yes/No	1		For dental entries only
Dental Treatment Cat	Byte	1	Look-up Link	Type of Dental treatment (Dental Treatment Category Codes Table)
Referral?	Yes/No	1		Was this a referral from another clinic for the same problem?

Tab H 3.1.3 Database Structure - A5/4/94 Data Table

A&D DATA TABLE				
Field Name	**Type**	**Length**	**Indexed**	**Comments**
Register #	Long Integer	4	Primary Key	Assigned to each admission
Patient #	Integer	2	Indexed	Linked to Patient Sequence # in Patient Data table
DOA	Date/Time	8	Indexed	Admission Date
TOA	Date/Time	8		Admission Time
DOD	Date/Time	8		Time of Discharge / Death
TOD/C	Date/Time	8		Date of Discharge / Death
D/C Clerk	Text	5	Look-up Link	Discharge Clerk (Clerks Table)
PrimProv	Text	20		Primary Provider
SI/VSI	Yes/No	1		Seriously Ill / Very Seriously Ill
Death	Yes/No	1		Death
BI or DNBI	Integer	2	Look-up Link	Battle, Non Battle Injury & Disease (Illness Type Table)
Reportable Disease?	Yes/No	1		Reportable Disease
Diagnosis1	Memo	0		First Diagnosis
DxCode1	Text	10		ICD-9 Code, First Diagnosis
...				...
Diagnosis10	Memo	0		Tenth Diagnosis
DxCode10	Text	10		ICD-9 Code, Tenth Diagnosis
Procedure 1	Memo	0		First Procedure
PCode1	Text	10		ICD-9 Code, First Procedure
...				...
Procedure10	Memo	0		Tenth Procedure
PCode10	Text	10		ICD-9 Code, Tenth Procedure
Primary Diagnostic Category Code	Text	5	Look-up Link	Primary Diagnostic Category Code (Diag Cats-General Table)
Diag Organ System Cat 1	Text	20	Look-up Link	(Sub)Specialty code for diagnosis 1
...			... Look-up Link	... (Diagnosis Organ System Table)
Diag Organ System Cat 10	Text	20	Look-up Link	(Sub)Specialty code for diagnosis 10

Tab H 3.1.4 Database Structure - Operations Table

OPERATIONS TABLE				
Field Name	**Type**	**Length**	**Indexed**	**Comments**
OR Case #	Counter-Long	4	Primary Key	Assigned to every operation
Patient #	Integer	2	Indexed	Linked to Patient Sequence # in Patient Data Table
Register #	Long Integer	4	Indexed	Manually looked up in A & D table
Room #	Text	5		ER, Ward, Operating Room 1 or 2
Operation Date	Date/Time	8	Indexed	Date of Operation
Anesth Start Time	Date/Time	8	Indexed	Anesthesia Start Time
Anesth End Time	Date/Time	8		Anesthesia End Time
Surgery Start Time	Date/Time	8	Indexed	Surgery Start Time
Surgery End Time	Date/Time	8		Surgery End Time
Nursing Start Time	Date/Time	8		Nursing Start Time
Nursing End Time	Date/Time	8		Nursing End Time
Diagnosis 1	Memo	0		First Operative Diagnosis
DxCode 1	Text	10		ICD-9 Code, First Diagnosis
...				...
Diagnosis 10	Memo	0		Tenth Operative Diagnosis
DxCode 10	Text	10		ICD-9 Code, Tenth Diagnosis
Urgency	Integer	2	Look-up Link	Urgency of Operation (OR Urgency Categories Table)
Circulator 1	Text	20		Circulating Staff 1
...				...
Circulator 4	Text	20		Circulating Staff 4
Scrub 1	Text	20		Scrubbed Staff 1
...				...
Scrub 4	Text	20		Scrubbed Staff 4
Anesthetist 1	Text	20		Anesthetist 1
...				...
Anesthetist 4	Text	20		Anesthetist 4
Surgical Assistant 1	Text	20		Surgical Assistant 1
...				...
Surgical Assistant 4	Text	20		Surgical Assistant 4
Anesthetic	Integer	2	Look-up Link	Type of Anesthetic Administered (Anesthetic Types Table)
Procedure 1	Memo	0		First Procedure
Proced Code 1	Text	10		ICD-9 Procedure Code, First Procedure
Proced Type 1	Text	5	Look-up Link	First Procedure Type (Surgical Procedure Type Table)
Surgeon 1	Text	20		Surgeon Performing First Procedure
...				...
Procedure 10	Memo	0		Tenth Procedure

Tab H 3.1.4 Database Structure - Operations Table

OPERATIONS TABLE				
Field Name	**Type**	**Length**	**Indexed**	**Comments**
Proced Code 10	Text	10		ICD-9 Procedure Code, Tenth Procedure
Proced Type 10	Text	5	Look-up Link	Tenth Procedure Type (Surgical Procedure Type Table)
Surgeon 10	Text	20		Surgeon Performing Tenth Procedure
Transfusion	Yes/No	1		Transfusion Given
Specimens	Memo	0		Specimens Taken
Drains	Memo	0		Location of Drains
Implants	Memo	0		Orthopedic Implants Used
Remarks	Memo	0		Remarks

Look-up Tables and Pop-up Menu Sources					
Table	**Field Name**	**Type**	**Length**	**Indexed**	**Comments**
Accident Categories	*Source for pop-up menu on Clinic Data Entry and Diagnostic Cats. Entry Forms*				
	Accident Category	Text	50		Cause of Accident
Anesthetic Types	*For Anesthetic Option Group on OR Data Entry Form*				
	Anesthetic Type	Text	30		Type of anesthesia
	Anesthetic Type Code	Byte	1		Can be linked to Operations Table 'Anesthetic' field
Battle Injury Type	*For Battle Injury Option Group on A&D and Diag Cats. Entry Forms*				
	B Injury Type	Text	50		Cause of Battle Injury
	BI Type #	Byte	1		Link via queries for reports
Clerks	*Source for pop-up menu on Patient Data and A&D Forms*				
	Name	Text	20		Clerk's name
	Initial	Text	5		Link to forms via Clerks Sort Query
Clinics	*Source for pop-up menu on Patient Data Entry and A&D Forms*				
	Abbreviation	Text	2	PrimaryKey	Link to forms via Clinic Sort Query
	Description	Text	50		Full name of clinic
Dental Diagnoses	*Source for pop-up menu on Dental Clinic Data Entry Form*				
	Dental Diagnoses	Text	80		Common Dental Diagnoses
Dental Treatment Category Codes	*For Treatment Cat. Option Group on Dental Clinic Data Entry Form*				
	Treatment Category	Text	10		Category of Treatment
	Treatment Cat Code #	Byte	1	PrimaryKey	Link to Outpatient Data Table 'Dental Treatment Cat' field
Dental Treatments/Cats	*Source for pop-up menu on Dental Clinic Data Entry Form*				
	Dental Treatments	Text	35		Common Dental Treatments
	Treatment Category	Text	7		Category of Treatment
	Treatment Cat Code #	Byte	1		For Reference Only
Dental Urgency Categories	*For Urgency Option Group on Dental Clinic Entry Form*				
	Urgency Category	Text	20		Urgent, Non Urgent Acute, or Elective
	Urgency Cat #	Byte	1		Link to Outpatient Data Table 'Urgency' field
Diag Cats-General	*Source for pop-up menu on Diagnostic Category-General Entry Form*				
	Dx Category	Text	50		Full Name of Diagnostic Category
	Dx Cat Code	Text	5	PrimaryKey	Link to A&D and Outpatient Data Tables '(Primary) Diagnostic Category Code' fields
	Dx Cat Description	Memo	0		List of Illnesses Belonging to the Category
	Order-UNPROFOR	Byte	1		Sort Order for UNPROFOR Report via Diag Cats-General Sort Query
	Order-USAFE	Byte	1		Sort Order for USAFE/EUCOM Report via Diag Cats-USAFE Sort Query
Diagnosis Organ System	*Source for pop-up menus on A&D Form*				
	Organ System Category	Text	20		(Sub) Specialty of Diagnosis
	Organ System Cat Code	Text	10		Link to A&D Data Table 'Diag Organ System Cat' fields
Illness Type	*For Illness Type on A&D Form*				
	Illness Type	Text	15		Battle Injury, Disease or Non Battle Injury

Tab H 2.1.5 Database Structure - Look-Up Tables List

Look-up Tables and Pop-up Menu Sources					
Table	**Field Name**	**Type**	**Length**	**Indexed**	**Comments**
	Type #	Byte	1		Link to A&D Data Table 'BI or DNBI' field
Nations	*Source for pop-up menus on Patient Data Form*				
	Abbreviation	Text	3	PrimaryKey	Link to Patient Data Table 'Nationality' field
	Nation	Text	50		Full name of Nation
Non-Battle Injury Type	*For Battle Injury Option Group on A&D and Diag Cats. Entry Forms*				
	NB Injury Type	Text	50		Cause of Non Battle Injury
	NBI Type #	Byte	1		Link via queries for reports
OR Staff	*Source for pop-up menus on OR Data Entry Form*				
	Name	Text	20		Name of Staff Member
	Function Code	Integer	2		Sort Code for OR Data Entry via OR Circul Staff Sort and OR Scrub Staff Sort Queries
OR Urgency Categories	*For Urgency Option Group on OR Data Entry Form*				
	Urgency Category	Text	20		Urgency of Operation
	Urgency Cat #	Byte	1		Link to Operations Table 'Urgency' field
Ortho Diagnoses	*Source for pop-up menu on Ortho Clinic Entry Form*				
	Diagnosis	Text	25		Common Orthopedic diagnoses
Ortho Treatments	*Source for pop-up menu on Ortho Clinic Entry Form*				
	Ortho Treatments	Text	40		Common Orthopedic treatments
Providers	*Source for pop-up menu on Clinic Data, OR Data and A&D Entry Forms*				
	Provider	Text	20	PrimaryKey	Name of Provider
	OR Sort #	Byte	1		Sort Code for OR Data Table via OR Provider Sort Query
	Ortho Sort #	Byte	1		Sort Code for Ortho Clinic Visit Entry Table via Ortho Provider Sort Query
	PT Sort #	Byte	1		Sort Code for PT Clinic Visit Entry Table via PT Provider Sort Query
	Dental Sort	Byte	1		Sort Code for Dental Clinic Visit Entry Table via Dental Provider Sort Query
PT Diagnoses	*Source for pop-up menu on PT Clinic Entry Form*				
	PT Dx/Assesment	Text	50		Common Physical Therapy diagnoses
PT Treatments	*Source for pop-up menu on PT Clinic Entry Form*				
	PT Treatment	Text	50		Common Physical Therapy treatments
Religions	*Source for pop-up menu on Patient Data Form*				
	Abbreviation	Text	2	PrimaryKey	Link to Patient Data 'Religion' field
	Religion	Text	50		Name of religion
Surgical Procedure Types	*Source for pop-up menu on OR Data Entry Form*				
	Procedure Type	Text	20		Surgical Specialty of Procedure
	Proced Type Code	Text	5		Link to Operations Table 'Proced Type' fields

Look-up Tables for Nationalities and Religions

Abbreviation	Nation	Abbreviation	Nation
AR	Argentina	LI	Libia
AU	Australia	LU	Luxemberg
BE	Belgium	MA	Malaysia
BG	Bangladesh	NI	Nigeria
BR	Brazil	NL	Netherlands
BU	Burma	NO	Norway
CH	China	NP	Nepal
CN	Canada	NZ	New Zealand
CO	Columbia	PE	Peru
CZ	Czech Republic	PI	Philipines
DK	Denmark	PK	Pakistan
EG	Egypt	PO	Poland
EQ	Equador	PR	Portugal
ET	Ethiopia	RO	Romulan
FI	Finland	RU	Russia
FR	France	SA	Saudi Arabia
GB	Great Britain	SI	Switzerland
GE	Germany	SK	Slovakian
GH	Ghana	SP	Spain
GU	Guyana	SU	Sudan
HR	Croatia	SV	Slovenian
IC	Iceland	SW	Sweden
IN	India	TU	Tunisia
IQ	Iraq	UG	Uruguay
IR	Ireland	UN	Unknown
IT	Italy	UR	Ukraine
JA	Jamaica	US	United States
JO	Jordan	VE	Venezuela
KE	Kenya	ZA	Ziare
LE	Lebanon		

Abbreviation	Religion
AD	Seventh Day Adventist
BA	Baptist
BU	Buddhist
CE	Church of England
CH	Christian
EP	Episcopalian
GO	Greek Orthodox
HI	Hindu
IS	Islam
JE	Jewish
JW	Jehovah's Witness
MO	Latter Day Saints
NO	None
OR	Orthodox
PD	Pagan Druid
PR	Protestant
RC	Roman Catholic
RO	Russian Orthodox
SO	Serbian Orthodox
UN	Unknown
WI	Wicca

Tab H3.1.7 Database Structure - Lookup Table Contents - Providers and Clinics

Providers and Clinical Area Sort Codes					
Provider	**(Specialty)**	**OR Sort #**	**Ortho Sort #**	**PT Sort #**	**Dental Sort**
Frost	(Ortho)	1	1		
Hatton	(Ortho)	1	1		
Jennings	(Gen Surgery)	2			
Rizzoni	(Gen Surgery)	2			
Lewis	(Gen Surgery)	2			
Ifune	(Gen Surgery)	2			
Day	(Oral Surgery)	3			1
Easter	(Oral Surgery)	3			1
Samanie	(Anesthesia)	4			
Mielke	(Anesthesia)	4			
VanSickel, A	(Anesthesia)	4			
VanSickle, J	(Anesthesia)	4			
Stoecker	(Anesthesia)	4			
Graven	(Family Practice)	5			
Derby	(Family Practice)	5			
Martino	(Internal Medicine)	5			
Maassen	(Internal Medicine)	5			
Stout	(PT)	5		1	
Dye	(Psychiatry)	5			
Dodge	(ER)	5			
Vujicic	(ER)	5			
Andress	(502 MASH)	6			
Ramos	(502 MASH)	6			
Lunn	(502 MASH)	6			
Drost	(502 MASH)	6			
Glaser	(502 MASH)	6			
Weber	(502 MASH)	6			
Perra	(502 MASH)	6	2		
Crabtree	(502 MASH)	6			
McGuire	(502 MASH)	6			
RN	(502 MASH)	6			
Brumage	(502 MASH)	6			
Massenburg	(502 MASH)	6			
Technician	(502 MASH)	6			
Edeker	(Dental Tech)	10			2
Smallman	(Ortho Tech)	10	3		
Maynard	(Ortho Tech)	10	3		
Evans	(PT Tech)	11		2	
Johnson	(Dental Tech)				2
Loudin	(Dental Tech)				2
Hinkle	(Dental Tech)				2
Fairfax	(Dental Tech)				2
Hirsch	(Dental Tech)				2
Benson	(Dental Tech)				2

Clinics	
Abbreviation	**Description**
ER	Emergency Room
PT	Physical Therapy
MH	Mental Health
UN	UNPROFOR Clinic
OR	Orthopaedics
DE	Dental
MS	Minor Surgery
AP	Appointment
DA	Direct Admit

Look-up Tables for Diagnoses and Treatments

Ortho Diagnoses	Ortho Treatments
Diagnosis	Short Leg Cast
Ankle Sprain	Short Leg Weight Bearing Cast
Low Back Pain	Short Arm Cast
Scaphoid Fracture	Short Arm Thumb Spica Cast
Wrist Fracture	Long Arm Cast
ACL Tear	Long Arm Thumb Spica Cast
MCL Tear	Referred to PT
LCL Tear	NSAIA - Motrin
Patella Dislocation	NSAIA - Naprosyn
Metatarsal Fracture	NSAIA - Other
Metacarpal Fracture	Local Injection
BB Forearm Fracture	Trigger Point Injection
Shoulder Dislocation	Closed Reduction
Femur Fracture	ORIF
Tibia Fracture	Spine Manipulation
Tibia & Fibula Fracture	Knee Immobilizer
Radius Fracture	Wrist Cockup Splint
Ulnar Fracture	Clavicle Strap
Fibula Fracture	Sling
Clavicle Fracture	Long Leg Cast
Gamekeeper's Thumb	Long Leg Weight Bearing Cast
	Patella Tendon Bearing
	Posterior Splint
	Thumb Spica Splint

PT Diagnoses	PT Treatments
Low Back Pain	Education
Tendonitis	Soft Tissue Mobilization
Headaches	Wound Care
Burns	Gait Training
Post Fracture Extremity dysfunction	Range of Motion
Ankle Injury	Progressive Resistive Exercise
Shoulder Dislocation	Stretching Exercises
Postop Soft Tissue Damage	Coordination Exercises
Knee Pain	Ultrasound / Phonophersis
Upper Back Pain	Electrical Stimulation
Extremity Muscle/Ligament Strain	Moist Heat
Shin Splints	Ice
Amputation	Debridement
Multiple Trauma	Joint Mobilization / Manipulation
Exercise Education Requested	Prosthetic Fitting
Patello-Femoral Syndrome	Prone Progressive Exercise
Intervertebral Disk Derangement	Theraputic Exercise
	US / ES Combination

Tab H3.1.8 Database Structure - Look-Up Table Contents - OR Data Entry Form Pop-Up Menus and Option Groups

OR Staff	(1 = Nurse; 2 = Tech)
Name	**Function Code**
Swansburg	1
McDaniel	1
Jones	1
Tackman	1
Sargent	2
Taylor	2
Balbi	2
Veeder	2
Chapman	2
Ferree	2
Carter	2
Spencer	2
Ceperich	2
Trexler	2
Alexander	2
Nason	2
[illegible]ker	2
Smailman	2
Maynard	2

Operative Urgency Categories	
Urgency Category	**Urgency Cat #**
Urgent	1
Non Urgent Acute	2
Elective	3

Type of Anesthesia	
Anesthetic Type	**Anesthetic Type Code**
General	1
Monitored	2
Stand-by	3
Spinal	4
Epidural	5
Bier Block	6
Axillary Block	7
None	8

Diagnostic Category	Dx Cat Code	Diagnostic Category Description	Order UNPROFOR	Order USAFE
Substance Abuse	ABU	Abuse of acohol, illegal drugs includind marijuana, pharmaceuticals (prescribed or unprescribed), or other substances	13	10
Dental	DEN	Dental injury, disease, or condition requiring care by a dentist	11	11
Dermatological Illnesses	DER	Viral rashes or lesions, cellulitis, fungal or bacterial infections, contact dermatitis, dermatitis caused by insect bites, skin ulcers, and eschars	6	4
Ophthalmic Illnesses/Injuries	EYE	Conjunctivitis, eye infections or irritations, corneal abrasions, foreign bodies, solar injury, trauma not associated with that reported under Injury	2	5
Fevers of Undetermined Origin	FUO	Fevers not apparently associated with diagnosed illness or injury	7	12
Gastrointestinal Illnesses	G-I	Diarrhea, gastroenteritis, dysentery, gastritis, food poisoning, constipation, intestinal parasites	7	2
Heat/Cold Injuries	H/C	Heat stroke, heat cramps, heat exhaustion, dehydration, sunburn, frostbite, chilblains, hypothermia	3	1
Injuries	INJ	Major Injuries are those requiring hospitalization or surgery. Fractures, sprains, lacerations, abraisions, internal injuries, burns and thermal injuries (not sunburn), non-envenomating animal bites (usually mammal or reptile), other trauma; (includes battle, nonbattle, occupational, recreational incidents.)	1	7
Other Medical Illnesses	MED	Cardiac-related problems such as chest pain, hypertension; neurological problems such as headaches, convulsions, syncopal episodes; allergic reactions, including systemtic reactions to venoumous bites/stings; hepatitis; urologenital illnesses not associated with sexually transmitted disease.	5	8
Psychiatric Illnesses	PSY	Depression, situational reactions, anxeity, neuroses, psychotic reactions, suicide attempts, behavioral reaction to medication or substance abuse.	12	6
Respiratory Illness	RES	Upper respiratiory infections, colds, bronchitis, asthma, pneumonia, pharyngitis, otitis, sinsusitis.	9	3
Sexually Transmitted Diseases	STD	Gonorrhea, syphilis, chlamydia, genital herpes, pelvic inflammatory disease, veneral warts/chancres.	10	13
Surgical Illnesses	SUR	Surgical conditions not related to trauma (e.g. , appendicitis, cholelithiasis);	4	9
Other	OTH	Not categorized, eg. 'left without being seen'	14	14

Tab H3.1.12 Database Structure - Illness, Accident and Injury Categories

Illness Types and Accident Categories

Illness Type	Type #
Battle injury	1
Disease	2
Non-battle injury	3

Accident Category
Vehicular accident
Sports
Misc
Indust
Fights
Falls
Unknown

Battle and Non Battle Injury Types

B Injury Type	BI Type #
Gun shot wound	1
Mine	2
Artillary	3
Other	4
Unknown	5

NB Injury Type	NBI Type #
Vehicular	1
Sports	2
Other	3
Unknown	4

Queries List

A&D I Outpt
Accid Outpt Report Q
Accident Categories by Nationality
Accident Category Sort
Anesthsia Provider Sort
Battle Injury Total
BI by Nation sort
BI Totals/ER
Clerks Sort
ClinicSort
Database Overview
Dental Dx Sort
Dental Tx Cats- US
Dental Tx Cats-Other UN
Dental Tx Cats-UN/US,AD/Civ
Dental Provider Sort
Dental Tx Sort
Diag Cats-General Sort
Diag Cats-Individual Clinic Monthly Re
Diag Cats-USAFE Sort
Diag Organ System Sort
Diagnostic Cat-Injury Report
Diagnostic Categories by Nation/ER
Diagnostic Categories-Gen Entry/Repor
Diagnostic Categories-USAFE Report S
Diagnostic Category/DENTAL
Diagnostic Category/MED
Med Inpatient Report Sort
Monthly Dx Cats by Nation sort
NationSort
NBI by Nation sort
NBI Totals by Nation sort
NBI Totals/ER

Queries List

OR Circul Staff Sort

OR Provider Sort

OR Scrub Staff Sort

Ortho Dx Sort

Ortho Provider Sort

Ortho Tx Sort

Outpatient Pediatrics sort

Patient U A&D

Patient U A&D for Daily Report

Patient U Operations

Patient U Outpatient for ER

Patient U Outpatient

ProviderSort

PT Dx Sort

PT Provider Sort

PT Tx Sort

ReligionSort

Surgical Procedure Type Sort

QueryName	Sort Order	Conditions	Field Name	Source Table / Query	Source Table Field	Joins	Source Table Field	Parameters	Type
A&D I Outpt									
	Ascending	> = 10/1/93	DOA	A&D Data	A&D Data	Inner	Outpatient Data		
			Register #	A&D Data	SeqNo		Patient #		
			Patient #	A&D Data					
			LName	Patient Data	A&D Data	Left	Outpatient Data		
			DOV	Outpatient Data	Patient #		PatientNo		
Accid Outpt Report Q									
	Ascending	[Begin. Date]-[End Date]	DOV	Outpatient Data	Patient Data	Inner	Outpatient Data	[Between Beginning Date:]	DateTime
			PatientNo	Outpatient Data	SeqNo		PatientNo	[And End Date:]	DateTime
			ID	Outpatient Data					
			Nation	Nations	Patient Data	Left	Nations		
			Chief Complaint	Outpatient Data	Nationality		Abbreviation		
			Diagnosis1	Outpatient Data					
			Address1	Patient Data					
		= Yes	Accident?	Outpatient Data					
			Accident Category	Outpatient Data					
		= No	(Follow-up)	Outpatient Data					
Accident Categories by Nationality									
	Group By (Rows)		Nationality	Patient Data	Patient Data	Inner	Outpatient		
	Pivot (Columns)		Falls	Outpatient Data	SeqNo		PatientNo		
	Pivot (Columns)		Fights	Outpatient Data					
	Pivot (Columns)		Indust	Outpatient Data	Patient Data	Left	Nations		
	Pivot (Columns)		Misc	Outpatient Data	Nationality		Abbreviation		
	Pivot (Columns)		MVA	Outpatient Data					
	Pivot (Columns)		Sports	Outpatient Data					
	Pivot (Columns)		Unknown	Outpatient Data					
		[Begin. Date]-[End Date]	(DOV)	Outpatient Data				[Between Beginning Date:]	DateTime
		= Yes	(Accident)	Outpatient Data				[And End Date:]	DateTime
		= No	(Followup)	Outpatient Data					
	Count		(ID)	Outpatient Data					
Accident Category Sort									
		Ascending	Accident Category	Accident Categories					
Anesthsia Provider Sort									
		Ascending	Provider	Providers					
		= 4	(OR Sort #)						

QueryName	Sort Order	Conditions	Field Name	Source Table / Query	Source Table Field	Joins	Source Table Field	Parameters	Type
Battle Injury Total									
	Ascending		Nationality	Patient Data	Patient Data	Inner	Outpatient Data		
	Ascending		DOV	Outpatient Data	SeqNo		PatientNo		
			LName	Patient Data					
			FName	Patient Data					
			Diagnosis1	Outpatient Data					
		= Yes	Battle Injury?	Outpatient Data					
		= No	Follow-up	Outpatient Data					
BI by Nation sort									
	Ascending		Nationality	Patient Data	Patient Data	Inner	Outpatient Data	[Between Beginning Date:]	DateTime
	Ascending	[Begin. Date]-[End Date]	DOV	Outpatient Data	SeqNo		PatientNo	[And End Date:]	DateTime
		= Yes	Battle Injury?	Outpatient Data				[Enter Clinic Code]	Text
		= [Enter Clinic Code]	Clinic	Outpatient Data					
BI Totals/ER									
	Ascending	[Begin. Date]-[End Date]	DOV	Outpatient Data	Patient Data	Inner	Outpatient Data	[Between Beginning Date:]	DateTime
		= Yes	Battle Injury?	Outpatient Data	SeqNo		PatientNo	[And End Date:]	DateTime
		= [Enter Clinic Code]	Clinic	Outpatient Data				[Enter Clinic Code]	Text
Clerks Sort									
			Initial	Clerks					
	Ascending		Name	Clerks					
ClinicSort									
	Ascending		Abbreviation	Clinics					
			Description	Clinics					
Dental Dx Sort									
	Ascending		Dental Diagnoses	Dental Diagnoses					
Dental Provider Sort									
	Ascending	Dental Sort>0	[Dental Sort]	Providers					
	Ascending		Provider	Providers					
Dental Tx Cats- US									
	Group By (Row)		Treatment Category	Diagnostic Category / DENTAL					
	Pivot (Column)	IIf([Civilian?]<0,"US Civilian","US AD")	US AD	Diagnostic Category / DENTAL					

Tab 113.2.1 Database Structure - Query Details

QueryName	Sort Order	Conditions	Field Name	Source Table / Query	Source Table Field	Joins	Source Table Field	Parameters	Type
	Pivot (Column)	IIf([Civilian?]<0,"US Civilian","US AD")	US Civilian	Diagnostic Category / DENTAL					
		= US	(Nationality)	Diagnostic Category / DENTAL					
	Count		ID	Diagnostic Category / DENTAL					
Dental Tx Cats-Other UN									
	Group By (Row)		Treatment Category	Diagnostic Category / DENTAL					
	Pivot (Column)	IIf([Civilian?]<0,"UN Civilian","UN AD")	UN AD	Diagnostic Category / DENTAL					
	Pivot (Column)	IIf([Civilian?]<0,"UN Civilian","UN AD")	UN Civilian	Diagnostic Category / DENTAL					
		= UN	(Nationality)	Diagnostic Category / DENTAL					
	Count		ID	Diagnostic Category / DENTAL					
Dental Tx Cats-UN/US,AD/Civ									
	Ascending		Treatment Category	Dental Tx Cats-Other UN	Dental Tx Cats-US	Inner	Dental Tx Cats-Other UN		
			US AD	Dental Tx Cats- US	Treatment Category		Treatment Category		
			UN AD	Dental Tx Cats-Other UN					
			US Civilian	Dental Tx Cats- US					
			UN Civilian	Dental Tx Cats-Other UN					
Dental Tx Sort									
	Ascending		Dental Treatments	Dental Treatments/Cats					
			Treatment Category	Dental Treatments/Cats					
			Treatment Cat Code #	Dental Treatments/Cats					
Diag Cats-General Sort									

Tab III.2.1 Database Structure - Query Details

QueryName	Sort Order	Conditions	Field Name	Source Table / Query	Source Table Field	Joins	Source Table Field	Parameters	Type
			Dx Cat Code	Diag Cats-General					
			Dx Category	Diag Cats-General					
	Ascending		(Order-UNPROFOR)						
Diag Cats-Individual Clinic Monthly Report Sort									
	Descending	[Begin. Date]-[End Date]	DOV	Outpatient Data	Patient Data	Inner	Outpatient Data	[Between Beginning Date:]	DateTime
	Ascending	= [Enter Clinic Code]	Clinic	Outpatient Data	SeqNo		PatientNo	[And End Date:]	DateTime
			PatientNo	Outpatient Data				[Enter Clinic Code]	Text
			ID	Outpatient Data	Outpatient Data	Left	Diag Cats-General		
			Follow-up	Outpatient Data	Diagnostic Category Code		Dx Cat Code		
			Chief Complaint	Outpatient Data					
			Accident?	Outpatient Data					
			Accident Category	Outpatient Data					
			Diagnosis1	Outpatient Data					
			Diagnosis2	Outpatient Data					
			Dx Category	Diag Cats-General					
			Diagnostic Category Code	Outpatient Data					
			Battle Injury?	Outpatient Data					
			Major Injury?	Outpatient Data					
			Ophthalmic?	Outpatient Data					
			BI Type	Outpatient Data					
			NBI Type	Outpatient Data					
			ETOH Related?	Outpatient Data					
			Reportable Disease?	Outpatient Data					
			Admitted?	Outpatient Data					
Diag Cats-USAFE Sort									
	Ascending		Order-USAFE	Diag Cats-General					
			Dx Cat Code	Diag Cats-General					
			Dx Category	Diag Cats-General					
			Dx Cat Description	Diag Cats-General					
Diag Organ System Sort									
	Ascending		Organ System Cat Code	Diagnosis Organ System					

Tab 113.2.1 Database Structure - Query Details

QueryName	Sort Order	Conditions	Field Name	Source Table / Query	Source Table Field	Joins	Source Table Field	Parameters	Type
			Organ System Category	Diagnosis Organ System					
Diagnostic Cat-Injury Report									
	Ascending	[Begin. Date]-[End Date]	DOV	Outpatient Data	Patient Data	Inner	Outpatient Data	[Between Beginning Date:]	[
			ID	Outpatient Data	SeqNo		PatientNo	[And End Date:]	DateTime
			PatientNo	Outpatient Data					
		= No	Follow-up	Outpatient Data	Outpatient Data	Left	Diag Cats-General		
			Accident?	Outpatient Data	Diagnostic Category Code		Dx Cat Code		
			Accident Category	Outpatient Data					
			Dx Category	Diag Cats-General	Outpatient Data	Left	Battle Injury Type		
			Battle Injury?	Outpatient Data	BI Type		BI Type #		
		= "INJ"	Diagnostic Category Code	Outpatient Data					
			Major Injury?	Outpatient Data	Outpatient Data	Left	Battle Injury Type		
			BI Type	Outpatient Data	NBI Type		NBI Type #		
			B Injury Type	Battle Injury Type					
			NBI Type	Outpatient Data					
			NB Injury Type	Non-Battle Injury Type					
			ETOH Related?	Outpatient Data					
		= No	Admitted?	Outpatient Data					
Diagnostic Categories by Nation/ER									
	Ascending	[Begin. Date]-[End Date]	DOV	Outpatient Data	Patient Data	Inner	Outpatient Data	[Between Beginning Date:]	DateTime
		= [Enter Clinic Code]	Diagnostic Category Code	Outpatient Data	SeqNo		PatientNo	[And End Date:]	DateTime
			Clinic	Outpatient Data				[Enter Clinic Code]	Text
			Nationality	Patient Data					
Diagnostic Categories-Gen Entry/Report Sort									
	Descending	[Begin. Date]-[End Date]	DOV	Outpatient Data	Patient Data	Inner	Outpatient Data	[Between Beginning Date:]	DateTime
			PatientNo	Outpatient Data	SeqNo		PatientNo	[And End Date:]	DateTime
			ID	Outpatient Data					
			Follow-up	Outpatient Data	Outpatient Data	Left	Diag Cats-General		

Tab 113.2.1 Database Structure - Query Details

QueryName	Sort Order	Conditions	Field Name	Source Table / Query	Source Table Field	Joins	Source Table Field	Parameters	Type
			Chief Complaint	Outpatient Data	Diagnostic Category Code		Dx Cat Code		
			Accident?	Outpatient Data					
			Accident Category	Outpatient Data					
			Diagnosis1	Outpatient Data					
			Diagnosis2	Outpatient Data					
			Dx Category	Diag Cats-General					
			Diagnostic Category Code	Outpatient Data					
			Battle Injury?	Outpatient Data					
			Major Injury?	Outpatient Data					
			Ophthalmic?	Outpatient Data					
			BI Type	Outpatient Data					
			NBI Type	Outpatient Data					
			ETOH Related?	Outpatient Data					
			Reportable Disease?	Outpatient Data					
			Admitted?	Outpatient Data					
			Clinic	Outpatient Data					
			LName	Patient Data					
Diagnostic Categories-USAFE Report Sort									
		[Begin. Date]-[End Date]	DOV	Outpatient Data	Patient Data	Inner	Outpatient Data	[Between Beginning Date:]	DateTime
			PatientNo	Outpatient Data	SeqNo		PatientNo	[And End Date:]	DateTime
			ID	Outpatient Data					
		= No	Follow-up	Outpatient Data	Outpatient Data	Left	Diag Cats-USAFE Sort		
			Chief Complaint	Outpatient Data	Diagnostic Category Code		Dx Cat Code		
			Accident?	Outpatient Data					
			Accident Category	Outpatient Data					
			Diagnosis1	Outpatient Data					
			Diagnosis2	Outpatient Data					
			Dx Category	Diag Cats-General					
		<> "OTH"	Diagnostic Category Code	Outpatient Data					
		= US	Nationality	Patient Data					

Tab 113.2.1 Database Structure - Query Details

QueryName	Sort Order	Conditions	Field Name	Source Table / Query	Source Table Field	Joins	Source Table Field	Parameters	Type
Diagnostic Category/DENTAL									
	Ascending		Provider	Outpatient Data	Patient Data	Inner	Outpatient Data	[Between Beginning Date:]	DateTime
	Ascending		Treatment Category	Dental Treatment Category Codes	SeqNo		PatientNo	[And End Date:]	DateTime
	Ascending		Admitted?	Outpatient Data					
		[Begin. Date]-[End Date]	DOV	Outpatient Data	Outpatient Data	Left	Dental Treatment Category Codes		
		= "DEN" OR	Diagnostic Category Code	Outpatient Data	Dental Treatment Cat		Treatment Cat Code #		
		= "DE"	Clinic	Outpatient Data					
			Diagnosis1		Outpatient Data	Left	Dental Urgency Categories		
			Treatment1	Outpatient Data	Urgency		Urgency Cat #		
			Urgency Category	Dental Urgency Categories					
			Nationality	Patient Data					
			Civilian?	Patient Data					
			ID	Outpatient Data					
			LName	Patient Data					
Diagnostic Category/MED									
		MED	Diagnostic Category Code	Outpatient Data	Patient Data	Inner	Outpatient Data	[Between Beginning Date:]	DateTime
			Diagnosis1	Outpatient Data	SeqNo		PatientNo	[And End Date:]	DateTime
	Ascending	[Begin. Date]-[End Date]	DOV	Outpatient Data				[Enter Clinic Code]	Text
		= [Enter Clinic Code]	Clinic	Outpatient Data					
Med Inpatient Report Sort									
	Ascending	In("abu","med","derm", "eye","g-i","res","psy", "std")	Primary Diagnostic Category Code	A&D.Data	Patient Data	Inner	Outpatient Data	[Between Beginning Date:]	DateTime
	Ascending	[Begin. Date]-[End Date]	DOA	A&D Data	SeqNo		PatientNo	[And End Date:]	DateTime
			Register #	A&D Data					
			PrimProv	A&D Data					
			Nationality	Patient Data					
		<>"endoscope"	Diag Organ System Cat 1	A&D Data					

Tab 113.2.1 Database Structure - Query Details

QueryName	Sort Order	Conditions	Field Name	Source Table / Query	Source Table Field	Joins	Source Table Field	Parameters	Type
		= 2	BI or DNBI	A&D Data					
			SeqNo	Patient Data					
			Reportable Disease?	A&D Data					
			Diagnosis1	A&D Data					
			Diagnosis2	A&D Data					
			Diagnosis3	A&D Data					
			Diag Organ System Cat 2	A&D Data					
			Diag Organ System Cat 3	A&D Data					
Monthly Dx Cats by Nation sort									
	Ascending		Nationality	Patient Data	Patient Data	Inner	Outpatient Data	[Between Beginning Date:]	DateTime
	Ascending		Diagnostic Category Code	Outpatient Data	SeqNo		PatientNo	[And End Date:]	DateTime
	Ascending	[Begin. Date]-[End Date]	DOV	Outpatient Data				[Enter Clinic Code]	Text
		= [Enter Clinic Code]	Clinic	Outpatient Data					
NationSort	Ascending		Abbreviation	Nations					
			Nation	Nations					
NBI by Nation sort									
	Ascending		Nationality	Patient Data	Patient Data	Inner	Outpatient Data	[Between Beginning Date:]	DateTime
	Ascending	[Begin. Date]-[End Date]	DOV	Outpatient Data	SeqNo		PatientNo	[And End Date:]	DateTime
		= Yes	Accident?	Outpatient Data				[Enter Clinic Code]	Text
		= [Enter Clinic Code]	Clinic	Outpatient Data					
NBI Totals by Nation sort									
	Ascending		Nationality	Patient Data	Patient Data	Inner	Outpatient Data	[Between Beginning Date:]	DateTime
	Ascending	[Begin. Date]-[End Date]	DOV	Outpatient Data	SeqNo		PatientNo	[And End Date:]	DateTime
		= Yes	Accident?	Outpatient Data					
NBI Totals/ER									
		= Yes	Accident?	Outpatient Data	Patient Data	Inner	Outpatient Data	[Between Beginning Date:]	DateTime
	Ascending	[Begin. Date]-[End Date]	DOV	Outpatient Data	SeqNo		PatientNo	[And End Date:]	DateTime

Tab 113.2.1 Database Structure - Query Details

QueryName	Sort Order	Conditions	Field Name	Source Table / Query	Source Table Field	Joins	Source Table Field	Parameters	Type
		=[Enter Clinic Code]	Clinic	Outpatient Data				[Enter Clinic Code]	Text
OR Circul Staff Sort									
	Ascending		[Function Code]	OR Staff					
	Ascending		Name	OR Staff					
OR Provider Sort									
	Ascending		[OR Sort #]	Providers					
	Ascending		Provider	Providers					
OR Scrub Staff Sort									
	Descending		[Function Code]	OR Staff					
	Ascending		Name	OR Staff					
Ortho Dx Sort									
	Ascending		Diagnosis	Ortho Diagnoses					
Ortho Provider Sort									
			Provider	Providers					
		> 0 AND < 4	[Ortho Sort #]	Providers					
Ortho Tx Sort									
	Ascending		Ortho Treatments	Ortho Treatments					
Outpatient Pediatrics Sort									
	Ascending	[Begin. Date]-[End Date]	DOB	Patient Data	Patient Data	Inner	Outpatient Data	[Between Birth Date of:]	DateTime
	Ascending		[Diagnostic Category Code]	Outpatient Data	SeqNo		PatientNo	[And Birth Date of:]	DateTime
	Ascending	=[Enter Clinic Code]	Clinic	Outpatient Data				[Enter Clinic Code]	Text
	Ascending		DOV	Outpatient Data					
			Nationality	Patient Data					
Patient U A&D									
		[All Fields]	Patient Data*	Patient Data	Patient Data	Inner	A&D Data		
		[All Fields]	A&D Data*	A&D Data	SeqNo		Patient #		
Patient U A&D for Daily Report									
	Ascending		[LName]	Patient Data	Patient Data	Inner	A&D Data		
		Is Null	DOD	A&D Data	SeqNo		Patient #		
			BI or DNBI	A&D Data					
		[All Fields]	Patient Data*	Patient Data	Patient Data	Left	Nations		
		[All Fields]	A&D Data*	A&D Data	Nationality		Abbreviation		
			Nation	Nations					

Tab III.2.1 Database Structure - Query Details

QueryName	Sort Order	Conditions	Field Name	Source Table / Query	Source Table Field	Joins	Source Table Field	Parameters	Type
			(Illness Type)	Illness Type	Illness Type	Left	A&D Data		
					Type #		BI or DNBI		
Patient U Operations									
		(All fields)	Patient Data*	Patient Data	Patient Data	Inner	Operations		
		(All fields)	Operations*	Operations	SeqNo		Patient #		
Patient U Outpatient									
		(All fields)	Patient Data*	Patient Data	Patient Data	Inner	Outpatient Data		
		(All fields)	Outpatient Data*	Outpatient Data	SeqNo		PatientNo		
	Ascending		(ID)	Outpatient Data					
Patient U Outpatient for ER									
		(All fields)	Patient Data*	Patient Data	Patient Data	Inner	Outpatient Data		
		(All fields)	Outpatient Data*	Outpatient Data	SeqNo		PatientNo		
	Ascending	< 10000	(ID)	Outpatient Data					
Provider Sort									
	Ascending		Provider	Providers					
		<> 10	(OR Sort #)						
PT Dx Sort									
	Ascending		PT Dx/Assesment	PT Diagnoses					
PT Provider Sort									
			Provider	Providers					
		> 0	(PT Sort #)						
PT Tx Sort									
	Ascending		PT Treatment	PT Treatments					
ReligionSort									
	Ascending		Abbreviation	Religions					
			Religion	Religions					
Surgical Procedure Type Sort									
	Ascending		Proced Type Code	Surgical Procedure Types					
			Procedure Type	Surgical Procedure Types					

Report Name	Record Source (Underlying Query or Table)
Accident Categories Monthly Totals	Accid Outpt Report Q
BI by Nation	BI by Nation sort
BI Totals	BI Totals/ER
Daily Inpatient Report	Patient U A&D for Daily Report
Dental Cats by US/UN and AD/Civ	Dental Tx Cats-UN/US,AD/Civ
Dental Patients by Nationality	Med Inpatient Report Sort
Dental Patients by Urgency Categories	Diagnostic Category/DENTAL
Dental Patients Details by Provider, Tx Cats	Diagnostic Category/DENTAL
Diag Cats-Individ Clinic Monthly Report	Diag Cats-Individual Clinic Monthly Report Sort
Diagnostic Categories by Nation/ER	Diagnostic Categories by Nation/ER
Diagnostic Categories-Weekly USAFE Report	Diagnostic Categories-USAFE Report Sort
Diagnostic Categories/MED	Diagnostic Category/MED
Diagnostic Cats-Monthly Injury Report	Diagnostic Cat-Injury Report Sort
Dianostic Categories Monthly Report	Diagnostic Categories-Gen Entry/Report Sort
Med Inpatients by Dx Cat and DOA	Med Inpatient Report Sort
Med Inpatients by Dx Cat and Nationality	Med Inpatient Report Sort
Med Inpatients by Dx Cat and Organ System	Med Inpatient Report Sort
Med Inpatients by Nationality	Diagnostic Category/DENTAL
Med Inpatients by Organ System and Dx Category	Med Inpatient Report Sort
Med Inpatients Details by Organ System	Med Inpatient Report Sort
Monthly Accident Report	Accid Outpt Report Q
Nation Abbreviations	NationSort
NBI by Nation	NBI Totals by Nation sort
NBI Totals/ER	NBI Totals/ER
Outpatient Daily Census	Patient U Outpatient
Outpatients Weekly Census by Nationality	Patient U Outpatient
Outpatients-Daily Report	Patient U Outpatient
Sub Accident Categories Totals	Accid Outpt Report Q

Form Name	Caption	Record Source (Underlying Table or Query)
A&D Form	A&D Form	Patient U A&D
Dental Clinic Visits Entry	Dental Clinic Visits Entry	Patient U Outpatient
Diagnostic Category-General Entry	Diagnostic Categories-General	Diagnostic Categories-Gen Entry/Report Sort
OR Data Entry	OR Log	Patient U Operations
Ortho Clinc Visit Entry	Ortho Clinic Visits Entry	Patient U Outpatient
Outpatient Visits Data Entry	Outpatient Clinics Data Entry	Patient U Outpatient for ER
Patient Data Entry	Patient Data	Patient Data
PT Clinic Visits Entry	PT Clinic Visits Entry	Patient U Outpatient
Transfer A&D Info	A&D Form	Patient U A&D
Transfer Outpt Visits	Outpatient Clinics Data Entry	Patient U Outpatient

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13. ABSTRACT *(Maximum 200 words)*

A database structure and its data were analyzed and discussed with the objective of facilitating the logistical planning of humanitarian medical responses by the military medical services in operations other than war (OOTWs). The database, designed and implemented at a triservice-managed field hospital in Zagreb, Croatia, is described in detail. The rationale for its creation is discussed, and its structure, including data tables and data elements/fields, is reviewed. Methods of classifying patient diagnoses for various practical purposes are described, as are the diagnoses themselves. Demonstrations of the usefulness of the database are presented in the form of cross-tabulations of various patient and population characteristics generated through the use of the database application's own query algorithms. Comparisons are made of different population subsets (male vs. female, civilian vs. military, US vs. Non-US/Non-Third World vs. Third World patients, etc.) on use of outpatient, inpatient, and surgical services. The data may prove useful to logisticians planning future medical operations for deployment to theaters similar to Zagreb and the Balkan Peninsula.

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